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ABSTRACT

International facilities are described in the first section of this directory on the facilities for education and training in basic subjects related to the peaceful uses of outer space. Entries are organized into these categories: organizations of the United Nations system; intergovernmental agencies; international agencies; international foundations and trust; and research establishments. A section for each country follows with these categories utilized where possible: national and state academies; government departments and official agencies; learned societies, professional institutions and other associations; foundations and trusts; government or official research establishments; industrial or commercial research organizations; and universities and colleges. Peaceful uses of outer space include scientific investigation, communication, meteorology, navigation, and directly allied subjects, with other basic subjects brought in where they seem important. (PR)

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International Directory of Facilities for Education and Training in Basic Subjects related to the Peaceful Uses of Outer Space

SE 013 509

UNITED NATIONS

International Directory of Facilities for Education and Training in Basic Subjects related to the Peaceful Uses of Outer Space

Report of the Secretary-General

UNITED NATIONS
New York, 1968

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NOTE

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Note by the Secretariat

To assist the United Nations Committee on the Peaceful Uses of Outer Space in its work, the Secretary-General has been asked to continue the compilation and updating of information on facilities for education and training in basic subjects related to the peaceful uses of outer space.

Following requests by the Secretary-General in 1965, many Member States submitted information on their national programmes, and further replies were received from the specialized agencies. Publications A/AC.105/28 and A/AC.105/C.1/L.11 and L.11/Add.1 were based thereon.

The present directory includes all this information, modified when necessary in the light of additional replies since received, and it includes also much new material obtained from government agencies, learned societies, research establishments, universities and other institutions throughout the world. Acknowledgement is also made to the many sources listed in the bibliography at the end of this directory. The Secretariat of the United Nations was assisted in the compilation of the directory by a special consultant, Mr. S. Buchanan, B.Sc., A.F.R.Ae.S., F.B.I.S., A.F.A.I.A.A., of the City University, London.

Although efforts have been made to check the accuracy and completeness of the information herein, it has not always been possible to do so. Inevitably, in work of this complexity, some omissions and mistakes will have occurred, and the Outer Space Affairs Group of the Secretariat of the United Nations would be grateful if recipients of the directory would advise them of any such errors.

In interpreting the phrase "basic subjects related to the peaceful uses of outer space", it is clearly possible to include a very wide range of the total field of formal education in all countries. Mathematics, physics, chemistry, engineering, medicine, law, economics and other domains could all be relevant. The compilers have taken the main peaceful uses as scientific investigation, communication, meteorology and navigation, and have tried to include all these and directly allied subjects, with other basic subjects brought in where they seemed especially important.

The designation of countries and territories and the arrangements of material in this publication should not be considered as implying any endorsement or other judgement by the Secretariat of the United Nations regarding the legal status of any country or territory, or of its authorities, or in respect of the delimitation of its boundaries.

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ABBREVIATIONS

AGARD	Advisory Group for Aerospace Research and Development (under NATO)
AIR	Italian Rocket Association
AVA	Experimental Aerodynamics Establishment (Federal Republic of Germany)
CENTO	Central Treaty Organization
CERN	European Organization for Nuclear Research
CETS	European Conference on Satellite Telecommunications
CNAE	National Commission for Space Activities (Brazil)
CNES	National Space Study Centre (France)
CNET	National Telecommunication Study Centre (France)
CNR	National Research Council (Italy)
CNRS	National Scientific Research Centre (France)
COSPAR	Committee on Space Research (under ICSU)
CSIC	Higher Council for Scientific Research (Spain)
CSIR	Council for Scientific and Industrial Research (South Africa)
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
DFL	German Aerospace Research Establishment (Federal Republic of Germany)
DGRR	German Rocket Technology and Space Travel Society (Federal Republic of Germany)
DSIR	Department of Scientific and Industrial Research (New Zealand)
DVL	German Experimental Establishment for Aviation and Space Flight (Federal Republic of Germany)
EEC	European Economic Community
ELDO	European Space Vehicle Launcher Development Organisation
ESRO	European Space Research Organisation
ETH	Federal Institute of Technology (Switzerland)
EURATOM	European Atomic Energy Community
EUROSPACE	European Industrial Group for Space Studies
IAEA	International Atomic Energy Agency
IAF	International Astronautical Federation
IAU	International Astronomical Union
ICAO	International Civil Aviation Organization
ICSU	International Council of Scientific Unions
IGC	International Geophysical Co-operation
IGY	International Geophysical Year
INCOSPAR	Indian National Committee for Space Research
IQSY	International Years of the Quiet Sun
ITU	International Telecommunication Union
NASA	National Aeronautics and Space Administration (United States of America)
NATO	North Atlantic Treaty Organization
OAS	Organization of American States
ONERA	National Establishment of Aerospace Study and Research (France)
SEATO	South East Asia Treaty Organization
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAF	United States Air Force
WGLR	Scientific Society for Aviation and Space Flight (Federal Republic of Germany)
WMO	World Meteorological Organization

CLASSIFICATION PLAN

In the section on international facilities at the beginning of this directory, items are listed in the following categories: organizations of the United Nations system; intergovernmental agencies; international agencies; international foundations and trusts; research establishments.

There follows a section for each country and, wherever possible, the following categories are employed: national and State academies; government departments and official agencies; learned societies, professional institutions and other associations; foundations and trusts; government or official research establishments; industrial or commercial research organizations; universities and colleges.

Establishments within each category are normally listed in alphabetical order. Where appropriate, the English translation of the name of an establishment appears in brackets immediately after the name in the original language.

Fellowships and studentships restricted to a specific establishment are normally listed immediately after other information in the entry for that establishment. Those more generally available are listed under "Universities and colleges".

Unless otherwise specified, $ signifies United States dollars and £ signifies pounds sterling.

INTERNATIONAL FACILITIES

ORGANIZATIONS OF THE UNITED NATIONS SYSTEM

United Nations Development Programme (UNDP), United Nations Headquarters, New York, United States of America.

UNDP awards fellowships (approximately 1,000), primarily to nationals of developing countries, upon the specific request of the Government concerned, for study in countries where special facilities exist for advanced training or study of a kind which will benefit the country of the recipient on his return home. Fields of study include industrial development, transport and communications. Tenure is usually three months to one year, with grants for cost of living, tuition, books and travel.

United Nations Educational, Scientific and Cultural Organization (UNESCO), 7/9 Place de Fontenoy, Paris 7e, France.

The purpose of UNESCO is to contribute to peace and security by promoting collaboration among nations through education, science and culture, in order to further universal respect for justice, the rule of law and the human rights and fundamental freedoms affirmed for the peoples of the world, without distinction of race, sex, language or religion, in the United Nations Charter.

The regular programme includes aid to scientific research in the natural sciences and their application to development, covering the fields of basic sciences, earth sciences (astronomy, geophysics and terrestrial physics) and others. Items have included promotion of the International Years of the Quiet Sun and the World Magnetic Survey, a continuing project of the International Geophysical Year. In connexion with the promotion of the free flow of information, the spread of education and cultural exchange, UNESCO organized an international meeting of experts in 1965, in co-operation with the International Telecommunication Union (ITU), to examine features of space radio and television transmissions.

Under contract to UNESCO, the International Astronomical Union (IAU) convened a meeting of experts in Nice, France, in July 1965, to discuss the training of astronomers and, in particular, the possibility of organizing a series of international summer schools in astronomy.

A practical training course in astronomical and geophysical observation methods, particularly in solar physics and geomagnetism, was held in Helwan, United Arab Republic, from February to April 1966, under the joint auspices of UNESCO and the Supreme Council for Scientific Research of the United Arab Republic. The course was attended by trainees from Saudi Arabia, Syria, Turkey and the United Arab Republic.

The UNESCO publication, *Study Abroad*,[1] indicates the assistance available from Governments and other agencies in the area of international education and training programmes. Fellowships are available for the training of specialists in UNESCO fields of interest.

Individual fellowships, usually for three to nine months, based on a United Nations stipend scale, are awarded in fields including natural science and technology and mass communication. The intention is to enable persons well established in their careers to gain international experience not only for their own benefit but also to enable them to make more active contributions to specific national or international projects. Applications must be made through the national commission or other body established for co-operation with UNESCO in the candidate's own country.

Fellowships for participation in group training schemes are awarded in fields including the natural sciences and mass communication; the procedure for applications is the same as that for individual fellowships.

UNESCO sponsors Latin American Science Campaign awards for the training of university teachers from its member States in Latin America in the natural sciences. In 1966, the awards were divided between studies in physics at the Physics Institute of San Carlos de Bariloche, Cuyo University, Argentina; studies in physics, chemistry, biology, geology and mathematics in the USSR, and studies in physics at the Latin American Physics Centre in Brazil.

Advanced studies (Africa) fellowships are donated by certain countries to nationals of UNESCO member States in Africa for the training of university staff and personnel for approved projects; the application procedure is the same as that governing individual fellowships.

International Atomic Energy Agency (IAEA), Kaerntnerring, Vienna I.

The agency's aim is to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. The IAEA programme provides for training (fellowships, exchange professorships, etc.) in the following fields related to outer space research: (*a*) nuclear physics; (*b*) nuclear reactors; (*c*) health physics and waste disposal, including avoidance of radiation hazards (shielding, ventilation, equipment and installation design, storage and transport,

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[1] United Nations Educational, Scientific and Cultural Organization, *Study Abroad, 1966-1968*, Paris, 1966.

health control and safety measures), medical supervision, hazards evaluation, contamination control and investigation of the behaviour of radioactive materials in man and his environment; (*d*) radiobiology, namely, physical, chemical and biological dosimetry and the effects of radiation and fission products on man and his environment.

Fellowships are available to nationals of member States of IAEA over 18 years of age who have graduated from a university or technical school of university level, and possess qualities of personality and character indicative of potential leadership in their own country in a chosen field of work. Training fellowships in the fundamental techniques of nuclear energy are open to graduates. Specialist training fellowships in theoretical and experimental aspects of the science and technology of nuclear energy are open to graduates with previous experience in nuclear science and technology. Research training fellowships are offered to candidates with high-level qualifications through research work in subjects of special interest. Special grants for study at the post-doctorate level may also be awarded; candidates must have completed their Ph.D. studies in some atomic energy field.

Awards are tenable in member States of IAEA with well developed programmes in atomic energy, under the following projects:

Fellowships subsidized by the agency from financial contributions by member States to the general fund or through funds under the United Nations Development Programme; tenure up to two years, with awards up to $300 per month plus tuition and book allowance;

Fellowships offered and subsidized directly by member States for training in their educational and scientific institutions; duration varies, in some cases up to six years, and stipend rates and travel expenses vary with the offers made by the different member States; applications should be made through the appropriate ministry or government department in the candidate's country.

International Civil Aviation Organization (ICAO), International Aviation Building, 1080 University Street, Montreal 3, Canada.

Its Technical Assistance Bureau operates United Nations Special Fund projects, including training centres for civil aviation and meteorology in Tunis (Tunisia), Bangkok (Thailand) and Casablanca (Morocco), and the National Aeronautical Laboratory, Bangalore, India. For further details, see the entry for the World Meteorological Organization (WMO).

Scholarships and fellowships are available to nationals of all countries whose Governments request technical assistance from ICAO under the United Nations Development Programme; awards are for the study of civil aviation, including meteorology and radio communications. Scholarships of approximately $150 per month for up to two years are for *ab initio* training of ground personnel. Fellowships averaging $250 per month for up to two years are awarded to suitably qualified personnel to equip them to contribute to the development of their countries on their return.

International Telecommunication Union (ITU), Palais des Nations, Geneva, Switzerland.

A Special Fund/ITU project provides for the creation in Ahmedabad, India, of a centre for training in the use of space communications.

Fellowships (approximately 100) are offered under the United Nations Development Programme to nationals of States Members of the United Nations and organizations within the United Nations system at the request of Governments. Fields of study include radio communications, and awards are open to technicians, engineers or administrators in telecommunications administration, private operating agencies or factories dealing with telecommunications apparatus; candidates must have had specialized training in telecommunications. Tenure is for a maximum of twelve months and the value of awards is based on UNDP stipend rates. Applications should be made to the relevant government department of the candidate's country.

World Meteorological Organization (WMO), 41 avenue Giuseppe-Motta, Geneva, Switzerland.

Includes technical commissions of synoptic meteorology, climatology, instruments and methods of observation, aerology and aeronautical meteorology. Its technical and technical co-operation divisions promote world co-operation in meteorological matters, exchange of information, co-ordination of research and instruction. Interregional seminars on the interpretation and use of meteorological satellite data, to train participants in the latest knowledge and utilization of information received from weather satellites, were held in Tokyo in 1964 for WMO members in Asia and in Europe in 1966 for WMO members in Europe.

An Executive Committee panel of experts on meteorological education and training was established at the seventeenth session of the WMO Executive Committee (1965) to (*a*) advise on all aspects of technical and scientific meteorological training; (*b*) provide guidance on the co-ordination of all WMO training activities, particularly in the developing countries; (*c*) recommend the training material most suitable for use by training centres; (*d*) advise on WMO collaboration with UNESCO and other international organizations in education and training, and (*e*) prepare programmes for WMO conferences and seminars concerning meteorological training.

WMO fellowships (70) are offered under the United Nations Development Programme to nationals of States Members of the United Nations and organizations within the United Nations system at the request of the Government concerned. Fellowships are for on-the-job training or study at meteorological training institutions in countries offering suitable facilities. The qualifications required of candidates vary according to the needs of beneficiary countries, and the value of awards is based on UNDP stipend rates. Training facilities are available at the institutions listed below.

1. University College, Nairobi, Kenya.

Chair of meteorology established with the assistance of WMO for training senior graduate meteorologists of the English-speaking countries in Africa. The course, which is at the postgraduate level, is of nine months' duration.

2. Lovanium University, Kinshasa, Democratic Republic of the Congo.

The WMO training plan in Africa includes the establishment of a chair for training senior graduate meteorologists of the French-speaking countries in Africa. As a provisional measure, arrangements have been made in Lovanium University for special courses to train candidates for appointment as senior meteorologists ; these candidates would be recruited in the third year of the faculty of sciences. The first of these courses started in January 1966 and a qualified part-time professor was appointed by WMO to plan, assist in lecturing and supervise the course. Other qualified WMO experts in the area will participate in teaching.

3. Regional Meteorological Training Centre, Lagos, Nigeria.

Established with the assistance of WMO. The training is designed in a phased programme starting with a six-months' course for meteorological observers, followed by a one-year course for meteorological assistants and ending with another one-year course for non-graduate forecasters or junior meteorologists. Candidates, from English-speaking countries in Africa, should have GCE (General Certificate of Education) " O " level education and scientific aptitude.

4. Regional Meteorological Training Centre, Nairobi, Kenya.

Established by the Governments of Kenya, Uganda and the United Republic of Tanzania (through the East African Common Service Organization) with the assistance of WMO. The course has two one-year phases, the first for meteorological assistant training and the second for junior meteorologist training. Candidates must have a GCE " O " level certificate or equivalent and must have completed meteorology observer training through national training facilities.

5. Meteorological Training Centre, Kinshasa, Democratic Republic of the Congo.

Established with the assistance of the United Nations Special Fund and WMO for the training of meteorologists of the French-speaking countries in Africa. Courses for training non-graduate forecasters and junior meteorologists are of twenty-seven months' duration, entry qualification being six years' post-primary education and one year's specialization in mathematics and/or physics. Meteorological assistant courses (sixteen months) are open to observers and others who have completed six years' post-primary education. For observer courses (twelve months), three years' post-primary education are required. Preparatory courses are arranged as necessary whenever candidates do not have the required qualifications.

6. Meteorological Institute for Research and Training, Cairo, United Arab Republic.

Established with the assistance of the United Nations Special Fund and WMO as an integral part of the United Arab Republic Meteorological Department. The broad functions of the institute include basic and applied research in meteorology as well as training for all categories of meteorological personnel in research and operational work. The institute when fully established will consist of five sections covering the following fields: research in dynamic meteorology and forecasting, micrometeorological research, physical climatological research, special meteorological investigations and training. The following training is organized at the institute under the supervision of international experts : (*a*) training of research workers by lecture courses, seminars and direct guidance in research ; (*b*) training in operational forecasting for students having attended the post-graduate diploma course in meteorology at Cairo University or other universities (each course has a duration of three months followed by on-the-job training) ; (*c*) refresher courses for meteorologists, organized once or twice a year to keep the meteorological staff in operational work acquainted with developments in various fields of meteorology ; (*d*) training courses for meteorological observers on surface, climatological, agrometeorological and pilot-balloons observations (each course is of four to five months' duration) ; (*e*) training courses on upper-air observations by electronic instruments for personnel who have passed observer courses and demonstrate ability for such work (each course is of eight months' duration) ; (*f*) training courses for meteorological instruments technicians. The duration of such courses varies from three to twelve months, depending on the specific subject of the course. In addition, the institute co-operates with the post-graduate courses of meteorology in Cairo University and arranges for the special types of training in meteorology that may be required by aviation institutes, faculties of engineering, agriculture etc.

The training facilities of the institute and the results of its research work will be made available as far as possible to meteorological personnel, particularly of the Middle East and Africa.

7. Civil Aviation Training Centre, Casablanca, Morocco.

WMO has been collaborating with ICAO in the meteorological programme. Courses are given for meteorological assistants (one year) and observers (eight months), generally beginning in September of each year.

8. Civil Aviation Training Centre, Tunis, Tunisia.

A WMO instructor gives courses for meteorological assistants (one year) and observers (nine months). Entrance requirements are respectively twelve years' and nine to ten years' primary and secondary education.

9. Civil Aviation Training Centre, Bangkok, Thailand.

Established by ICAO as a Special Fund project, WMO collaborating in the meteorological training. On completion of the Special Fund project, WMO took over responsibility for meteorological training, incorporating it in the WMO Special Fund project in Thailand for the expansion of meteorological services. The centre gives theoretical instruction and practical training up to junior meteorologist level, in sixteen-month

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courses. Entrance qualifications include experience in weather observation and meteorological codes, and a knowledge of mathematics and physics, preferably equivalent to a completed first year at a university.

INTERGOVERNMENTAL AGENCIES

Advisory Group for Aerospace Research and Development (AGARD), 64 rue de Varenne, Paris 7e, France.

The group functions under the North Atlantic Treaty Organization (NATO); its panels include an Aerospace Medical Panel, an Avionics Panel, a Combustion and Propulsion Panel, a Flight Mechanics Panel, a Fluid Dynamics Panel, a Structures and Materials Panel and a Technical Information Panel.

The purpose of the group is to bring together leading aerospace experts of the NATO nations in order to recommend effective use of research and development facilities for the common benefit of the NATO community. The principal panel activities are the sponsoring of technical meetings, symposia and colloquia, publication of surveys and research papers, and co-operation and exchange of information through their members. International training activities are conducted under the International Consultant and Exchange Programme, which provides scientific and technical advice through individual consultants to NATO countries and AGARD panels, and organizes seminars, technical courses and lecture series. The exchange aspect of the programme includes assignments of engineers and scientists in research establishments or universities for research on subjects of mutual interest, assignments for professors or specialists to lecture on fundamental topics, short-term assignments enabling engineers to become acquainted with scientific techniques in other NATO nations, arrangement of inter-laboratory conferences and exchange or loan of instruments or equipment for scientific research. A very large number of important scientific and technical publications has been sponsored by AGARD.

AGARD maintains a continuing interest in the Von Karman Institute of Fluid Dynamics in Belgium, which was established under its auspices.

Association of Commonwealth Universities, Marlborough House, Pall Mall, London, S.W.1.

Commonwealth Scholarships and Fellowships Plan: a system of over 1,000 awards to support educational interchange within the Commonwealth with, in general, each country offering scholarships and fellowships tenable at its own institutions of higher education by nationals of other Commonwealth countries. Details of their awards have been issued by Australia, Canada, Ceylon, Ghana, Hong Kong, India, Jamaica, Malaysia, Malta, New Zealand, Nigeria, Pakistan, Rhodesia, Sierra Leone and the United Kingdom. Awards are not allocated by quota for applicants in particular subjects: candidates in any academic discipline may apply.

Commonwealth scholarships are normally for graduates under 35 years of age who may be expected to make a significant contribution to life in their own countries on their return from postgraduate study abroad. Scholarships may be awarded for undergraduate study when facilities are not available in the candidate's country. The award normally covers travel and fees, with an allowance for maintenance, books and other expenses. Tenure is normally two years.

Awards of various kinds for persons of senior standing may be instituted, in addition, by some countries.

Commonwealth visiting professorships are awarded to distinguished scholars at the highest level; they are not open for application.

Commonwealth Advisory Aeronautical Research Council, National Physical Laboratory, Teddington, Middlesex, England.

Its purpose is to promote progress and to encourage the widest practical extension of aeronautical research throughout the British Commonwealth.

Conférence européenne sur les télécommunications par satellites (CETS) [European Conference on Satellite Telecommunications], 6 Burlington Gardens, London W.1., England.

Council for Technical Co-operation in South and South-East Asia, P.O. Box 596, Colombo 4, Ceylon.

Under the Colombo Plan for Co-operative Economic Development in South and South-East Asia, technical co-operation awards are arranged on a bilateral basis between the Governments of Colombo Plan member countries for study in fields including technology, engineering, atomic energy and communications. Terms and conditions are decided by the Governments concerned; all applications must be sponsored by the candidate's Government.

European Atomic Energy Community (EURATOM), 53 rue Belliard, Brussels, Belgium.

Awards are made for study and training at nuclear research centres in member countries of the European Community. Training grants are for graduates or students about to graduate in EURATOM member States, preferably in engineering, and with sufficient linguistic knowledge. Trainees take part in the regular work of permanent research teams at the centre. Tenure is two to twelve months, at $150 per month, plus transport. Fellowships are for students and young teachers in EURATOM member States, for specialized study or research in nuclear science. Tenure is twenty-four months maximum, at $200 to $400 per month, plus transport.

European Economic Community (EEC), Directorate General for Overseas Development, 56 rue du Marais, Brussels, Belgium.

Approximately 1,400 fellowships are available to nationals of overseas countries associated with EEC for practical and advanced training in fields vital to the economic and social development of the recipient's country and related to fields including technical sciences. Candidates are selected by their Governments. Tenure is one year, renewable, at 6,000 to 10,000 Belgian francs, plus allowance for travel, tuition, insurance and equipment.

European Organization for Nuclear Research (CERN), Geneva, Switzerland.

Awards are made to enable scientists to undertake pure research in high energy nuclear physics (theoretical and experimental) in Geneva. Fellowships (approximately 40) are for qualified scientists in nuclear physics or an allied field from CERN member States (Austria, Belgium, Denmark, Federal Republic of Germany, France, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom). Visiting scientist appointments are open to well qualified scientists from all countries. Tenure is twelve months, at 18,000 to 33,600 Swiss francs annually according to age and qualifications, with a higher upper limit for senior scientists, plus family allowance, travel and other expenses.

Vacation student appointments (90) for university students from CERN member States, specializing in nuclear research, applied physics or an allied field, afford experience at the CERN laboratory near Geneva. Candidates must have completed at least two years' university training. Tenure is two to four months during the summer vacation, at 24 Swiss francs per day, plus travel allowance.

European Space Research Organisation (ESRO), 36 rue la Pérouse, Paris 16e, France.

ESRO's aim is to achieve and develop, exclusively for peaceful purposes, collaboration between European States in space research and technology. The States concerned are Belgium, Denmark, Federal Republic of Germany, France, Italy, Netherlands, Spain, Sweden, Switzerland and the United Kingdom, with Austria and Norway as observers. Sections include the following:

European Space Data Centre (ESDAC), Darmstadt, Federal Republic of Germany: computing centre for the processing and analysis of data and the study of fundamental problems relating to forecasting and the analysis of orbits;

European Space Research Laboratory (ESLAB), Noordwijk, Netherlands: co-ordination of scientific projects;

ESTRACK: network comprising a tracking and telemetry station in the process of establishment in Redu, Belgium, and three telemetry stations, one of which will be established in Spitzbergen; this network will be co-ordinated by a control centre at Noordwijk, Netherlands;

European Space Technology Centre (ESTEC), Delft and Noordwijk, Netherlands: headquarters and applied research centre for the construction and testing of satellites, space probes and rocket payloads containing the apparatus for the scientific experiments proposed by the research groups in the member States; staff will number 800, including 250 research and engineering personnel;

Launching range (ESRANGE), at Kiruna, Sweden, for the launching of sounding rockets;

European Space Research Institute (ESRIN), via Sulpicio Galba, Fascati, Rome, Italy; a fundamental research institute for the study of chemical and physical phenomena of space, such as atomic processes and low density plasmas, for the better understanding of the results obtained from space experiments.

Scientific round-table conferences have been held on the interplanetary medium, space astronomy, astronomy in European space research, space research on the structure of the atmosphere and meteorology and the scientific objectives of the large ESRO astronomical satellite. Summer schools have been organized for the study of space physics, space technology and electromagnetic radiation from space, and colloquia have been held on solar physics and on auroral and associated magnetospheric phenomena at high altitudes. National research groups are provided with launching facilities and assistance in their experiments is offered by the ESRO Space Technology Centre, in collaboration with European industry. Experiments deal with the atmospheric structure and meteorology, the ionosphere and auroral phenomena, solar and general astronomy, the moon, planets, comets and interplanetary medium, the stars and stellar systems, cosmic rays and trapped radiation. The first ESRO satellites will be launched by the National Aeronautics and Space Administration (NASA) in the United States of America.

Fellowships of various grades, in space science and technology, are offered to nationals of ESRO member States. For senior research associateships, candidates should be scientists or engineers with more than four years' post-doctoral research experience; post-doctoral fellowships are open to those with one to four years' post-doctoral research experience; research fellowships are open to graduates who have completed their training in research techniques and shown aptitude for original research, and research studentships to graduates or students with equivalent qualifications, with less than one year's training in research techniques. The studentships are available only under scheme (*c*) below.

These awards are offered in connexion with the schemes listed hereunder.

(*a*) ESRO/NASA fellowships (30) for research in space science and technology at participating universities in the United States of America administered jointly by ESRO and the United States National Academy of Sciences. Candidates must possess a degree equivalent at least to that of M.Sc. in an American university, and a good knowledge of English. The purpose of this scheme is to train space scientists and technologists to enable them to take an active part in European space programmes. The duration is one academic year (renewable) and the awards cover a monthly allowance of about $250 (with additional allowances for married fellows) and transport. Costs of tuition, research and travel to the United States are paid by the United States National Academy of Sciences.

(*b*) Scientific programme fellowships (approximately 20) to enable scientists from institutions in member States which do not yet have the facilities to take an active part in the ESRO scientific programme to be attached to teams in other institutes engaged in the preparation of experiments for inclusion in the

programme. The duration is one academic year (renewable) and the value of the awards varies according to age, qualifications and experience.

(*c*) European university fellowships (approximately 10) for post-graduate study and research training in disciplines related to space science and technology. The object of this scheme is to provide recipients with the necessary basic training for a career in space science or technology, and to broaden their experience through study at a foreign university. The duration is one academic year (renewable) and the value of the awards varies according to age, qualifications and experience.

Applications should be made to ESRO through the national authority sponsoring the candidate ; candidates should also inform the Assistant Director of Scientific Information and Education at ESRO of their intention to apply.

European Space Vehicle Launcher Development Organisation (ELDO), 36 rue la Pérouse, Paris 16e, France.

Established by a convention signed by Australia, Belgium, Federal Republic of Germany, France, Italy, Netherlands and the United Kingdom, with Denmark having observer status. The initial programme is the development of a three-stage space vehicle launcher with a first series of satellite test vehicles, the first stage being the British Blue Streak, the second French and the third German. The satellite test vehicle is being developed by Italy, with the Netherlands responsible for telemetry, Belgium for the ground guidance station and Australia for the firing range facilities. Future programmes are under consideration.

Inter-American Committee for Space Research, Rodriguez Peña 1693, Buenos Aires.

The committee's aim is the promotion of space research in the Latin American countries through exchange of information, exchange of research personnel and joint programmes of research, teaching and educational activities. In co-ordination with NASA, the committee has awarded scholarships and travel expenses to South American students to attend summer courses on space physics at Columbia University, New York.

Organization of American States (OAS), Pan-American Union, Washington D.C., United States of America.

Six hundred fellowships are available to residents of OAS member States, for study in other member States. Candidates must have advanced training in the field of study in which they wish to specialize. On completion, recipients must return to their home to devote themselves for a set minimum period to the profession or specialization concerned. Tenure is three months to two years. Maximum value covers travel, fees, materials and maintenance, but not allowance for dependants.

The Summer and Academic Year Institute's programme for Latin American teachers of science and mathematics (in co-operation with the United States National Science Foundation) offers twenty fellowships for intensive training in fields including chemistry, mathematics and physics, at colleges and universities in the United States of America. Usually at least three years' teaching experience is required and excellent understanding of English is necessary. Duration is three months (June to August) for summer institutes or one academic year, and awards cover fees, maintenance and travel.

The Leo S. Rowe Pan-American Fund, Department of Education Affairs, makes loans to nationals of Latin American countries for advanced study or research at institutions of higher education in the United States of America. Awards are interest-free loans to be repaid within five years of completion of studies. Maximum tenure is two years.

International agencies

Association internationale des constructeurs de matériel aérospatial (AICMA) [International Association of Aerospace Constructors], 6 rue Galilée, Paris 16e, France.

The association has a standing committee for wind tunnels and a committee for standardization. It was formed for the study of the common interests of the aerospace industries in Belgium, Denmark, Federal Republic of Germany, France, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom.

Committee on Space Research (COSPAR), 55 boulevard Malesherbes, Paris 8e, France.

Formed in 1958, after the conclusion of the International Geophysical Year, to continue and foster international co-operation in all sciences making use of the new research tools of rockets and satellites. It is a committee of the International Council of Scientific Unions (ICSU), the membership comprising ten international scientific unions and thirty-two national scientific institutions. The six working groups, for tracking, telemetry and dynamics, design and co-ordinattion of experiments, data and publications, upper atmosphere properties, space biology and scientific space experiments concerned with the properties and dynamics of the troposphere and stratosphere, play a major part in COSPAR activities. In addition, there is a consultative group on potentially harmful effects of space experiments and a panel on space education and training.

Congrès international des techniques du vide en recherche spatiale (CIVRES) [International Congress for Vacuum Techniques in Space Research], 147 ter A, boulevard de Strasbourg, Nogent-sur-Marne, Seine, France.

Conseil international de droit spatial [International Council of Space Law], 29 rue Desaix, Paris 15e, France.

Club spatial international [International Space Club], 123 route de Châtenay-Malabry, le Plessis-Robinson, Seine-et-Oise, France.

Federation of Astronomical and Geophysical Services, c/o ICSU, 2 via Sebenico, Rome, Italy.

Publishes a *Quarterly Bulletin of Solar Activity* and maintains a monitoring organization on solar particles and radiations.

Groupement industriel européen d'études spatiales (EUROSPACE) [European Industrial Group for Space Studies], 8 rue Cognacq-Jay, Paris 7e, France.

The association comprises industrial organizations formed for the purpose of making a common effort in civil space matters: satellite telecommunications and television, meteorological and navigation satellites, launch vehicles, aerospace transporters, etc. The association is also concerned with the legal and economic aspects of such projects.

Institut international des communications [International Communications Institute], viale Brigate Partigiane 18, Genoa, Italy.

This is a research institute for the promotion of air, space, land and marine communications and telecommunications.

International Academy of Astronautics (IAA), 250 rue Saint-Jacques, Paris 5e, France.

Formed at the 1960 Congress of the International Astronautical Federation. Holds scientific meetings and makes scientific studies and reports. Awards prizes, including the Daniel and Florence Guggenheim International Astronautics Award of $1,000, and fellowships. Includes committees for an international lunar laboratory, history of rockets and astronautics, and space relativity; also sections for basic sciences, engineering sciences and life sciences.

International Academy of Aviation Medicine, 35 rue Cardinal Mercier, Brussels 1, Belgium.

International Association of Meteorology and Atmospheric Physics (IAMAP), c/o Meteorological Branch, Air Services, Department of Transport, 315 Bloor Street West, Toronto 5, Ontario.

Its aim is to relate meteorological research to the physics of the atmosphere and to other branches of science. Belongs to the International Union of Geodesy and Geophysics.

International Astronautical Federation (IAF), 250 rue Saint-Jacques, Paris 5e, France.

Its aim is to foster the development of astronautics for peaceful purposes at national and international levels. Members include the national astronautical societies in thirty-four countries. The main activity is the annual congress. Space education is a recurring topic treated at the congresses.

International Astronomical Union (IAU), Observatoire de Nice, Mont-Gros, Nice, France.

Its aim is to facilitate co-operation between the astronomers of various countries and to further the study of astronomy in all its branches. Organizes triennial general assemblies and symposia and promotes publications. Is a member of ICSU.

Travel grants (7 to 15) in astronomy, including astrophysics, are available to professional astronomers and graduate students from all countries, to promote the international exchange of young astronomers and to give astronomers from countries not well equipped an opportunity to study in countries with better observatories. Grants cover cost of travel; in exceptional cases a contribution towards living expenses may also be made. Applications should be addressed to Professor M. G. J. Minnaert, President of IAU Committee on Exchange of Astronomers, International Astronomical Union, Zonnenburg 2, Utrecht, Netherlands.

International Council of Aeronautical Sciences, American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, New York, N.Y., United States of America.

International Council of Scientific Unions (ICSU), 2 via Sebenico, Rome, Italy.

Recognized by UNESCO as the co-ordinating and representative body of international scientific unions.

International Geophysical Committee, 6 Cornwall Terrace, London, N.W.1, England.

Formed to continue the work of the International Geophysical Year in meteorology, nuclear radiation, aurora and airglow, solar activity, ionosphere research, cosmic rays and other matters. Belongs to ICSU.

International Institute of Space Law (IISL), 1735 DeSales Street, N.W., Washington, D.C., United States of America.

Formed at the 1960 Congress of the International Astronautical Federation to study legal and sociological aspects of astronautics.

International Mathematical Union, Tata Institute of Fundamental Research, Colaba, Bombay 5, India.

Its aim is to promote international co-operation in development of mathematical science, pure, applied and educational. Federated to ICSU.

International Telecommunications Satellite Consortium (INTELSAT), represented by Interim Communications Satellite Committee, c/o COMSAT, 1900 L Street N.W., Washington, D.C., United States of America.

International Union of Geodesy and Geophysics, Geophysics Laboratory, University of Toronto, Canada.

Interests include meteorology and atmospheric physics, geomagnetism and aeronomy. Federated to ICSU.

International foundations and trusts

British Council, Universities Department, State House, High Holborn, London W.C.1, England.

Operates a university interchange scheme with South Africa, similar to the scheme for educational interchange within the Commonwealth operated by the Association of Commonwealth Universities, which sees that scholarships are offered to foreign students for study in the United Kingdom.

English-Speaking Union of the Commonwealth, Dartmouth House, 37 Charles Street, Berkeley Square, London, W.1., England.

In conjunction with the English-Speaking Union of

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the United States of America, offers fellowships and assistantships at United States universities, with temporary teaching posts arranged through the Woodrow Wilson National Fellowship Foundation.

International Association for the Exchange of Students for Technical Experience (IAESTE), Kennedyallee 50, 532 Bad Godesberg, Federal Republic of Germany.

The reciprocal exchange programme offers 9,000 to 10,000 grants in technology, natural science and other subjects to undergraduates in IAESTE countries (Argentina, Austria, Belgium, Canada, Chile, Colombia, Czechoslovakia, Denmark, Federal Republic of Germany, Finland, France, Greece, Iceland, India, Iran, Ireland, Israel, Italy, Japan, Lebanon, Luxembourg, Netherlands, Norway, Poland, Portugal, South Africa, Spain, Sudan, Sweden, Switzerland, Syria, Tunisia, Turkey, United Arab Republic, United Kingdom, United States of America and Yugoslavia) to enable recipients to acquire practical experience in industry abroad as part of, or supplementary to, their academic study. Tenure is six to twelve weeks during the summer vacation, exceptionally up to twelve months. Students are paid by industrial firms.

International Union of Students, Vocelova 3, Prague 2, Czechoslovakia.

Offers approximately 170 undergraduate scholarships and ten postgraduate scholarships to students from dependent or newly independent countries for study in Albania, Bulgaria, Czechoslovakia, Democratic Republic of Germany, Hungary, Poland, Romania and the USSR. Tenure is five to seven years, and awards cover maintenance, tuition and spending money.

Rotary International, 1600 Ridge Avenue, Evanston, Illinois, United States of America.

Offers twenty-five Rotary Foundation awards for technical training to male students from all countries in which there are Rotary clubs for study in any other such country. Awards are for study only in technical subjects below the professional level, and candidates, aged 21 to 35, must satisfy the entrance requirements of the institution at which the award is tenable. Tenure is up to twelve months and awards cover travel, maintenance and fees.

United States-United Kingdom Educational Commission, 71 South Audley Street, London W.1., England.

Under the provisions of the Fulbright-Hays Act, offers competitive travel grants for academic study, research or lecturing in the United States to suitably qualified citizens of the United Kingdom and dependent territories. Candidates must have guaranteed financial support for the period of the visit. At least a good second-class degree or its equivalent is required.

Zonta International, 59 East Van Buren Street, Chicago, Illinois, United States of America.

Offers two Amelia Earhart fellowships for graduate study of aerospace sciences in the United States or elsewhere, available to women students from all countries; candidates must possess a bachelor's degree in sciences forming a background for advanced study in aerospace sciences, a high scholastic record and be highly qualified for graduate work. Tenure is one year (renewable) at $2,500.

Research establishments

International Foundation of the High-Altitude Research Station, Jungfraujoch, 5 Bühlplatz, Berne, Switzerland.

Solar Particles and Radiations Monitoring Organization (SPARMO), Laboratoire de physique cosmique, 2 rue des Vertugadins, Meudon, Seine-et-Oise, France.

Von Karman Institute of Fluid Dynamics, 72 chaussée de Waterloo, Rhode-Saint-Genèse, Brussels, Belgium.

Founded by the late Professor Theodore von Karman, under the auspices of AGARD and supported by NATO. A one-year postgraduate diploma course in experimental fluid dynamics and shorter special courses are offered. No tuition fees are payable by students; certain maintenance and travel grants are available, concerning which information may be obtained from the institute. There is a research fellowship programme, supported by the fellows' countries or by contracts. Fellows can work for the D.Sc. degree of a Belgian university. Much of the work has aerospace applications. A condition of entry is citizenship of one of the NATO nations; another is fluency in either English or French. Scientists of international reputation visit the institute to give lectures and seminars on their specialities and to supplement the regular staff in conducting short lecture courses on special subjects. The staff always includes a visiting professor from the Arnold Engineering Development Centre, Tullahoma, Tennessee, United States of America.

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Algeria

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Station de poursuite de satellites [Satellite Tracking Station] Hammaguir.

This is a satellite tracking station and launching base operating under the French National Centre for Space Studies (CNES).

UNIVERSITIES AND COLLEGES

Lycée technique aéronautique d'Etat [State Aeronautical Technical College].

University of Algiers, 2 rue Didouche Mourad, Algiers.

University institutes include the Bouzareah observatory, the Institut de météorologie et de physique du globe [Institute of Meteorology and Terrestrial Physics] and the Institut de l'énergie solaire [Institute of Solar Energy].

Argentina

NATIONAL AND STATE ACADEMIES

Academia Nacional de Ciencias de Buenos Aires [National Academy of Sciences], Leandro N. Alem 651, 7° piso, Buenos Aires.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Comisión Nacional de la Energía Atómica [National Atomic Energy Commission], 825° avenida del Libertador General San Martín, Buenos Aires. Formed to promote and undertake scientific and industrial research and applications of nuclear transmutations and reactions.

Studentships of the National Atomic Energy Commission Organization of American States (OAS), are offered to nationals of Latin American countries. A one-year studentship for study in Buenos Aires of design and development of electronic equipment is available to graduates in electronics. Two three-year studentships are available at the Institute of Physics of San Carlos de Bariloche, Río Negro. Eight one-year research studentships are tenable in the commission's laboratories or for advanced study of general or high energy physics in Buenos Aires.

Comisión Nacional de Investigaciones Espaciales [National Commission for Space Research], Perú 710, Buenos Aires.

Instituto Nacional de Derecho Aeronáutico y Espacial [National Institute of Aerospace Law], Av. Quintana 591, Buenos Aires.

Instituto Nacional de Medicina Aeronáutica y Espacial [National Institute of Aerospace Medicine], Callao 1306, Buenos Aires.

Museo Nacional de Aeronáutica [National Aeronautical Museum], Aeroparque de la Ciudad de Buenos Aires.

Servicio Meteorológico Nacional [National Meteorological Service], Paseo Colón 317, Buenos Aires.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Asociación Amigos de la Astronomía [Association of Friends of Astronomy], Avda. Patricias Argentinas 550, Buenos Aires. Possesses its own observatory.

Asociación Argentina de Astronomía [Astronomical Association of Argentina], Observatorio Astronómico de la Plata, Paseo del Bosque, La Plata.

Asociación Argentina de Ciencias Aerospaciales [Argentine Association of Aerospace Sciences], Rodriguez Peña 1693, Buenos Aires.

Asociación Argentina de Geofísicos y Geodestas [Geophysics and Geodesy Association of Argentina], Observatorio Astronómico de la Plata, Paseo del Bosque, La Plata.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Centro Argentino de Experimentaciones Astronáuticas [Argentine Centre for Astronautical Experiments], Escuela Industrial de Aviación, Jorge Newbery Haedo, Buenos Aires.

Centro de Experimentación y Lanzamiento de Proyectiles Autopropulsados [Experimental and Launching Centre for Autopropelled Projectiles], Chamical, La Rioja ; an establishment of the Ministry of Aeronautics, Juncal 1114, Buenos Aires.

Instituto de Experimentación Astronáuticas [Institute for Astronautical Experiments], Avda. Pte. R. Saenz Peña 1119, of. 614, Buenos Aires.

Astronomical Observatory of the National University of Cordoba, Laprida 854, Córdoba.

Cosmic Physics Observatory, San Miguel.

UNIVERSITIES AND COLLEGES

Under the auspices of the National Commission for Space Research, various universities offer study and

specialized training, in Argentina and abroad, financed by the commission. Subjects include ionospheric research, cosmic radiation, aeronomy, and technological and scientific aspects of the development of electronic equipment and sounding rockets. Courses similar to those at the University of Buenos Aires are expected to become available in other institutions of higher education.

Latin American School of Physics, Tucuman, offers magnetohydrodynamics, solar physics, physics of the magnetosphere and interplanetary plasma, and statistical mechanics. It also offers short courses in space law. These are under the auspices of the National Commission for Space Research.

Pontificia Universidad Católica Argentina, Santa María de los Buenos Aires [Catholic University of Argentina], Río Bamba 1227, Buenos Aires. Includes Faculty of Physical Sciences, Mathematics and Engineering. Studentships are offered to nationals of all countries who have completed secondary education and are proceeding to university studies. Tenure is eight months (renewable), with total or partial exemption from fees. For specialist studies for graduates, each case is considered on its own merits.

University of Buenos Aires, Calle Viamonte 444, Buenos Aires. Includes Faculty of Exact and Natural Sciences (Perú 222). Under the auspices of the National Commission for Space Research, offers mathematics, physics, astrophysics, meteorology, astrionics, electromagnetics, quantum mechanics, spherical astronomy, statistical astronomy and celestial mechanics.

Two scholarships for postgraduate courses or specialization are offered to Mexican graduates from the National Autonomous University of Mexico, for one academic year.

Scholarships for research or advanced or specialized courses are offered to graduates of Universidad Mayor, Real y Pontificia, Sucre, Bolivia (1); the University of Costa Rica, San José, Costa Rica (1); the Central University, Quito, Ecuador (1), and the Hebrew University of Jerusalem, Israel (1). Tenure is ten months.

Exchange scholarships are offered to graduates of French universities for specialization or advanced courses or research. Tenure is eight months, with travel expenses and 16,000 pesos.

National University of the North-East, 25 de Mayo No. 868, Corrientes. Faculty of Exact, Physical and Natural Sciences offers mathematics, cosmography and astronomy.

La Plata National University, Calle 7, Entre 47 y 48, La Plata. Faculty of Mathematics and Physics (Calle 1 esquina 47), offers aeronautics and meteorology. Affiliated schools and institutes include the Instituto Superior del Observatorio Astronómico [Astronomical Observatory], Paseo del Bosque, La Plata, which prepares candidates for doctorates in astronomy and geophysics. University scholarships (140) are offered to nationals of all countries, with preference for those of slender economic means, with distinguished study records or who have shown interest in teaching or university research. Tenure is one academic year, at 4,000 pesos.

National University of the South, Avenida Colón 80, Bahía Blanca. Department of Geography offers meteorology, climatology and cosmography.

National University of Tucuman, Ayacucho 482, Tucumán. Includes Faculties of Exact Sciences and Technology and of Natural Sciences at Salta. Exchange studentships are offered to foreign students from countries which allow similar concessions to students from Argentina.

Government grants for nationals of other countries include those of the Ministry of Education and Justice, Buenos Aires, for nationals of the Philippines for advanced study; the Ministry for External Relations, Buenos Aires, for exchange studentships with the United States of America, for completion of studies or research; the Secretariat of War, Buenos Aires, for nationals of countries of Western Europe and of America, for training, advanced courses and specialization.

For information on study grants available to nationals of Argentina or to students at universities in Argentina for study in other countries, see the UNESCO publication *Study Abroad*.[1]

Australia

National and State academies

Australian Academy of Science, Gordon Street, Canberra City, Australian Capital Territory. Its aim is to promote, proclaim and disseminate scientific knowledge.

Government departments and official agencies

Antarctic Division of Department of External Affairs, 568 St. Kilda Road, Melbourne. Research interests include cosmic rays and upper atmosphere physics.

Australian National Committee on Space Research c/o Dr. D. F. Martyn, Upper Atmosphere Section, CSIRO, Carrington Road, Camden, New South Wales.

Commonwealth of Australia Bureau of Meteorology, Box 1289 K, G.P.O., Melbourne. Trainees attached to the bureau may be eligible for a three-year full-time course for an associateship diploma in applied physics (meteorology).

Commonwealth Scientific and Industrial Research Organization (CSIRO), 314 Albert Street, East Melbourne, C.2. Includes Divisions of Applied Physics, Meteorological Physics, Physics and Radiophysics. Upper Atmosphere Section at Carrington Road, Camden, New South Wales.

Department of the Interior offers a one-year full-time postgraduate course for meteorologists-in-training to graduates in physics and mathematics.

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[1] United Nations Educational, Scientific and Cultural Organization, *Study Abroad, 1966-1968*, Paris, 1966.

Learned societies, professional institutions and other associations

Astronomical Society of South Australia, Inc., Box 199 C, G.P.O. Adelaide.

Astronomical Society of Tasmania, G.P.O. Box 154 B, Hobart.

Australian and New Zealand Association for the Advancement of Science, Science House, 157 Gloucester Street, Sydney, New South Wales, with branches in the State capitals.

Aviation Medical Society of Australia, Sydney, New South Wales. Organizes international meetings on aerospace medicine.

Institute of Applied Science of Victoria, Swanston Street, Melbourne. Includes Engineering, Applied Physics, Chemistry and Communications Departments; also a planetarium and telescope demonstrations.

Royal Aeronautical Society (Australian Division), 157 Gloucester Street, Sydney, New South Wales.

Government or official research establishments

Aeronautical Research Laboratories (ARL), Fishermen's Bend, Melbourne, Victoria. Divisions include aerodynamics, materials and structures. There is also a Department of Supply organization for defence research and development in aeronautics, engineering and rockets.

Astronomical State Observatory, Perth, Western Australia.

Australian National Radio Astronomy Observatory of the Radiophysics Laboratory of CSIRO, Parkes, New South Wales. The radio telescope is a steerable parabolic aerial system of 210 ft. diameter for investigation of radio waves from extraterrestrial sources.

Government Observatory, Sydney, New South Wales.

Narrabri Observatory, Narrabri, New South Wales. Possesses a stellar intensity interferometer, with two 25 ft. diameter parabolic mirrors for measuring the size, temperature and brightness of stars; see University of Sydney entry.

Riverview Observatory, Riverview, Sydney, New South Wales. Concerned with astronomy, seismology and geophysics.

Satellite Tracking Station, near Brisbane, Queensland.

Smithsonian Astrophysical Laboratory, Woomera, South Australia. Operates in association with the Smithsonian Institution, The Mall, Washington D.C., United States of America.

Weapons Research Establishment (WRE), Salisbury, Box 1424 H, G.P.O., Adelaide. This is the Department of Supply organization for defence research and development of guided missiles, electronics and high speed aerodynamics. Functions include operation of a joint Australian-United Kingdom project for testing guided missiles; upper atmosphere research and satellite tracking in co-operation with the United Kingdom and the United States; and the launching of the European co-operative ELDO space vehicles. In Salisbury, South Australia, are located the Trials Wing (trials and instrumentation systems divisions); Space Physics Wing (systems assessment, United States co-operative projects and applied physics divisions); Engineering Wing (electronics and communications divisions), and Rockets Research and Development Wing (aerodynamics, physics, chemistry and projects divisions). The Ranges Group is at Woomera, South Australia.

Universities and colleges

There are no special fellowships in fields related to the peaceful uses of outer space, but many general postgraduate grants may be used in these fields. Those listed are supplemented by awards made by industrial and commercial organizations. Further, young graduates may continue to study for higher degrees while employed as demonstrators, teaching fellows or tutors; many overseas students do this, as there are relatively few awards open to them. Travelling scholarships and grants to enable Australian graduates and others to study in other countries are listed in the UNESCO publication, *Study Abroad*.[2]

Further information on higher education in Australia may be found in *Directory of Courses* and *Some Opportunities for Post-Graduate Study at Australian Universities*, published by the Commonwealth Office of Education, 50 Miller Street, North Sydney, New South Wales.

The Commonwealth (of Australia) scholarship scheme makes 400 new awards annually of up to $1,586[3] for undergraduates and $3,600 plus $800 for fees and expenses for postgraduates.

Australian international awards (12) are available from the Commonwealth Office of Education, P.O. Box 189, North Sydney, New South Wales, to nationals of countries in which Australia has a special interest, for study in Australia. Fellowships worth $1,800 annually, plus travel and tuition fees, are open to recent graduates for work towards a second degree, to experienced officers requiring a programme of visits, or to other such persons. Scholarships of $1,400 per annum plus expenses are given for undergraduate courses. Applications should be made to the appropriate ministry or government agency in the candidate's country.

The Commonwealth scholarship or fellowship plan provides for 40 fellowships for nationals of Commonwealth countries for postgraduate study in fields not available in the candidate's country: usually for two years at $1,800 per annum for postgraduates or $1,400 for undergraduates, plus some expenses. Application should be made to the agency of the plan in the candidate's own country. Two visiting professorships are available to professors for attachment to an Australian university, for one year, covering return air travel costs, by invitation only.

Rothmans University Endowment Fund, c/o University of Sydney, Sydney, New South Wales, provides

[2] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[3] The currency referred to in this section is the Australian dollar.

fellowships for study in Australia to nationals of all countries possessing the exceptional academic qualifications required. Candidates for junior awards must have had at least three years' postgraduate research experience and senior fellowships are awarded only to outstanding scholars. Tenure is one year, renewable, at $2,200 to $10,000 plus some expenses.

Colombo Plan awards (approximately 1,360) from the Department of External Affairs, Canberra, Australian Capital Territory, are available to nationals of South and South-East Asian countries for study in Australia in subjects which will contribute to the economic development of the recipient's country. Fellowships for postgraduate study are $1,800 plus some expenses, scholarships for undergraduate study are $1,400, plus some expenses. Special arrangements are made for mature persons already in senior posts. Applications should be made to the Colombo Plan agency in candidate's country.

Colombo Plan correspondence scholarships for South and South-East Asian countries, for correspondence courses, cover costs of tuition, textbooks and postage.

Special Commonwealth African Assistance Plan awards (approximately 100), available to nationals of Commonwealth countries in Africa, are similar to Colombo Plan awards.

Australian National University, Box 4, G.P.O., Canberra, Australian Capital Territory. Originally primarily concerned with research and research training in select, limited fields but, since 1961, has operated undergraduate courses in a School of General Studies as well as research in the Institute of Advanced Studies. The latter includes a Research School of Physical Sciences.

B.Sc. degrees are awarded for three-year full-time courses (four years for honours) ; also M.Sc., Ph.D. and D.Sc. degrees. Undergraduate course subjects include physics and mathematics. Degree of Ph.D. obtainable for three to four years full-time postgraduate work in astronomy, engineering physics, geophysics, mathematics or nuclear physics. The Mount Stromlo Astronomical Observatory is one of the major observatories of the southern hemisphere, equipped with a range of telescopes, the largest being a 74-inch reflector ; the programme includes stellar spectroscopy, the precise measurement of time, study of the Milky Way and other galaxies, notably the star clouds of Magellan. The observatory collaborates with the radio-astronomy section of the Radiophysics Laboratory of CSIRO in Sydney, and selected students can prepare doctoral theses in radio-astronomy based on observations with the 210 ft. radio telescope at Parkes, New South Wales. A field station on Siding Spring Mountain near Coonabarabran, New South Wales, is maintained by the observatory. Other postgraduate study opportunities occur in geophysics, electron and ion diffusion, engineering physics, intense magnetic fields, plasma physics, nuclear physics using a 12 MeV tandem van de Graaff accelerator, physics of ionized gases, shock tubes, fluid mechanics, theoretical physics, solid state physics, quantum mechanics and general relativity theory.

The Faculty of Law offers courses in air and space law.

Fellowships are available in the physical sciences, including but not restricted to space subjects. Research scholarships (90) are offered to graduates of all countries of master's standing, with capacity for research : tenure is three years at $2,130 annually with additions for married scholars with children and for travel to and from Canberra. General Motors-Holden's Ltd. research fellowships (3) of $1,600 to $2,400 for one year (renewable), with travel grants, are available for graduates with research experience who intend to follow careers in Australia.

Flinders University of South Australia, Bedford Park, Adelaide. B.Sc. degree courses are offered. Opportunities for postgraduate study arise in magnetohydrodynamics, dynamic meteorology, plasma physics, solid state physics and spectroscopy.

Macquarie University, 171-177 Epping Road, Eastwood, New South Wales. This is a new university which started courses in 1966 ; its school of earth sciences gives opportunities for postgraduate study in geophysics and experimental physics.

Monash University, Wellington Road, Clayton, Victoria. Includes Faculties of Science and Engineering. B.Sc. awarded for three-year full-time courses (four years for honours) ; also M.Sc. and Ph.D. degrees. B.Eng. in electrical or mechanical engineering awarded for four-year full-time courses ; also M.Eng.Sc. and Ph.D. degrees.

Opportunities for postgraduate study occur in elastomechanics, systems dynamics, astrodynamics, vehicle re-entry dynamics, dynamic stability of orbital vehicles, computer simulations, thermal stress problems, heat exchange systems, chemical engineering, communications theory, circuit theory, control systems, analogue computation, electromagnetic field theory, power systems, meteorology, shock tubes, plasma physics, astrophysics, general theory of relativity, relativistic stellar dynamics, atomic and nuclear physics, low temperature physics, magnetic studies, optics and optical spectroscopy.

Research scholarships are available to nationals of all countries who are suitably qualified graduates of any recognized university ; tenure is one year renewable up to a maximum of four years, at $1,600 to $2,000 according to qualifications and experience.

Royal Melbourne Institute of Technology, 124 Latrobe Street, Melbourne, Victoria. Provides technological courses including aeronautical engineering.

University College of Townsville, P.O. Box 499, Townsville, Queensland. Provides three-year full-time B.E. courses. Opportunities for postgraduate study occur in anomalous transequatorial radio signals, airglow emissions from the night sky, electromagnetic radiation, propagation and aerial design, monitoring of radio signals from scientific ionospheric satellites, radio methods of studying meteorological phenomena, upper atmosphere observations for cosmic-ray and gamma-ray studies, and ionospheric studies of the tropical E layer.

University of Adelaide, Adelaide, South Australia. Includes Faculties of Engineering, Science and Techno-

logy. Affiliated institutions include the South Australian Institute of Technology, North Terrace, Adelaide, and the Mawson Institute for Antarctic Research. Bachelor of technology degree in electrical, electronic or mechanical engineering awarded for three-year full-time courses; bachelor of engineering degree awarded for five-year full-time courses; also M.Eng., Ph.D and D.Sc. degrees.

B.Sc. awarded for three-year full-time courses (four years for honours); B.App.Sc. for four-year full-time courses; also M.Sc., Ph.D. and D.Sc. degrees. Diploma in computing science awarded for one-year full-time or two-year part-time postgraduate courses.

Opportunities for postgraduate study arise in control technology, automatic control, guidance systems, systems analysis, plasma dynamics, atmospheric circulation, meteor astronomy, ionospheric irregularities, space research, seismology, solid state physics, atomic physics and vacuum ultra-violet physics; at Mawson Institute for Antarctic Research, polar upper atmosphere physics, aurora and trapped radiation, day and night airglow and geophysics.

No special fellowships are allocated for space subjects, but general grants may be held in these subjects. Imperial Chemical Industries of Australia and New Zealand research fellowships (one every two years) of $2,200 per year for two years (renewable) are offered to graduates from Commonwealth countries. Some scholarships for study abroad are available to graduates of the University of Adelaide.

University of Melbourne, Parkville, N.2, Melbourne, Victoria. Includes Faculties of Science, Applied Science and Engineering.

B.Sc. awarded for three-year full-time courses (four years for honours); B.App.Sc. awarded for four-year full-time courses; also M.Sc., M.App.Sc., Ph.D., D.Sc. and D.App.Sc. degrees. Subjects available include mathematics, physics, geophysics and meteorology. B.Eng. in electrical or mechanical engineering awarded for four-year full-time courses; also M.Eng.Sc., M.Eng., Ph.D. and D.Eng. degrees.

Opportunities for postgraduate study are available in geophysics, meteorology, micrometeorology, aeronautical turbulence, nuclear physics, diffraction and solid state physics, and theoretical physics. Other physics studies are conducted in conjunction with the Department of Physics of the Royal Australian Air Force Academy.

University research fellowships are available to nationals of any country for study at the University of Melbourne: senior awards (2) are for senior university staff, tenable for one to three years at $5,300 to $6,600; junior awards (4) are for graduates at post-doctoral level for one to three years, at $3,700 to $5,300. The Sir Thomas Lyle fellowship in physics is available to a student from any country who is a graduate of the University of Melbourne or any other approved university, with some research experience, tenable for two years (renewable) at $3,200 to $4,000. Awards are available to graduates of the University of Melbourne for study abroad.

University of New England, Armidale, New South Wales. Includes Faculty of Science.

B.Sc. awarded for three or four-year full-time courses (for honours, extra one or two years); also M.Sc., Ph.D. and D.Sc. degrees.

Opportunities for postgraduate study arise in elasticity, fluid dynamics, cosmology, plasma physics, ionospheric physics and solid state physics.

Research fellowships of Imperial Chemical Industries of Australia and New Zealand are available to nationals of Commonwealth countries, with honours degrees, tenure one year (renewable) at $2,200. Travelling scholarships are available to Australian graduates of this university for study abroad.

University of New South Wales (formerly New South Wales University of Technology), P.O. Box 1, Kensington, Sydney, N.S.W. Includes Faculties of Science, Applied Science and Engineering. B.Sc. awarded for three-year full-time or seven-year part-time courses, with one or two years more for honours. Subjects include geophysics. M.Sc., Ph.D. and D.Sc. degrees are also awarded. B.Eng. awarded for four-year full-time courses and B.Sc. (technology) for six-year part-time courses. Branches include aeronautical, electrical and mechanical engineering. M.Eng., M.Tech., Ph.D. and D.Sc. degrees are also awarded (M.Tech. in nuclear engineering after one-year full-time or two-year part-time courses).

Research awards are available to nationals of all countries. Post-doctoral research fellowships (10) are for a minimum of two years, renewable for one year, at $3,500 to $4,500. Postgraduate research scholarships for candidates who intend to establish permanent domicile in Australia are for one year, renewable to a maximum of four years at $2,350 to $4,000. An Imperial Chemical Industries of Australia and New Zealand research fellowship for a graduate of any recognized university in the Commonwealth is awarded for two years at $2,200.

Opportunities for postgraduate research are available in geophysics, plasmas, communications, computing, solid state electronics, aerodynamics, gasdynamics, fluid mechanics, heat transfer, solar energy, special relativity, cosmology including interpretation of radio- and optical-astronomy observations, nuclear physics, quantum mechanics, electro-magnetics, astrophysics and cryogenics.

University of Newcastle, Shortland, New South Wales. B.Sc. awarded for three-year full-time or five to seven-year part-time courses, with one or two years more for honours; also M.Sc. and Ph.D. degrees. B.Eng. awarded for four-year full-time courses and B.Sc. (technology) for six-year part-time courses. Branches include electrical and mechanical engineering. M.Eng. and Ph.D. degrees are also awarded.

Postgraduate research opportunities occur in ultra-high vacuum work, ionospheric and space physics (geomagnetic micropulsations, solar noise and X-ray emission and radar meteor studies).

University of Queensland, St. Lucia, S.W.6, Brisbane, Queensland. Includes Faculties of Science and Engineering. B.Sc. awarded for three-year full-time courses

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(four or five years for honours) ; B.Sc.App. awarded for four-year full-time courses. Subjects include geophysics. M.Sc., M.Sc.App., Ph.D. and D.Sc. degrees are also awarded. B.Eng. awarded for four-year full-time or seven-year part-time courses. Branches include electrical and mechanical engineering. M.Eng.Sc., M.Eng., Ph.D. and D.Eng. degrees are awarded.

Overseas students scholarships are available to graduates from all countries for one year, renewable to a maximum of three years, at $1,800 annually. An Imperial Chemical Industries of Australia and New Zealand research fellowship is offered to a graduate student from a Commonwealth country, with research training, for two years at $2,200. Scholarships and awards are open to Australian graduates of this university for study or research abroad.

Opportunities for postgraduate research arise in fuel cells, control systems, communications and electronics, climatology, geophysics, seismology, gravity, quantum mechanics, fluid dynamics, theoretical astrophysics, cosmology, upper atmosphere physics (ionosphere and exosphere) using radar, geomagnetic and geoelectric techniques and cosmic rays.

University of Sydney, Sydney, New South Wales. B.Sc. awarded for three-year full-time courses (four years for honours) ; also M.Sc., Ph.D. and D.Sc. degrees. Subjects include physics, pure mathematics, applied mathematics, geophysics, astronomy and computer science. Postgraduate study opportunities occur in astronomy (the astronomical station at Narrabri, N.S.W., operates a stellar interferometer project in collaboration with the University of Manchester in the United Kingdom ; the Fleurs radio astronomy station is situated near St. Mary's, N.S.W.), astrophysics, plasma physics and geophysics.

B.Eng. awarded for four-year full-time courses (five years for honours in electrical engineering) ; also M.E., M.Eng.Sc., Ph.D. and D.Sc.Eng. Subjects include aeronautical, electrical and mechanical engineering. Postgraduate study opportunities occur in fluid mechanics, hypersonics, gas physics, structures, control systems, radio propagation, radio-astronomy, navigation, electronics, solid state physics, plasma physics, power systems, automatic control and computer engineering.

Trust funds include special bequests to provide research fellowships, scholarships and prizes, available but not especially allocated for space subjects. The A. E. and F. A. Q. Stephens postgraduate research fellowship of $2,000 for one year (renewable) is available to graduates from all countries. For postgraduate studies on science or technology, the Henry Bertie and Florence Mabel Gritton research scholarships (2) are open to graduates of any university in the Commonwealth or to graduates of any other university who are British subjects ; the value range is $2,000 to $4,150 for one year (renewable). The F. H. Loxton studentships or scholarships (3) are open to nationals of all countries, with a value range of from $2,000 to $4,150 for one year (renewable up to four years). Several fellowships and travel grants are available to graduates of the University of Sydney.

University of Tasmania, P.O. Box 252C, Hobart, Tasmania. Includes Faculties of Science and Engineering. B.Sc. awarded for three-year full-time courses (four years for honours). Subjects include geophysics. M.Sc., Ph.D. and D.Sc. degrees are also awarded. B.Eng. awarded for four-year full-time courses ; branches include electrical engineering, electrical engineering communications and mechanical engineering. M.Eng.-Sc., M.Eng. and Ph.D. degrees are also awarded.

An Imperial Chemical Industries research fellowship is offered to a British citizen with a degree in science or engineering, for up to three years at $2,200 annually. A Titan Products research fellowship is offered to a student of any country with an honours degree in science from this university or an equivalent qualification, for two years at $2,400 annually.

Opportunities for postgraduate research arise in engineering, geophysics and mathematics.

University of Western Australia, Nedlands, Perth, W.A. Includes Faculties of Science and Engineering. B.Sc. awarded for three-year full-time courses (four years for honours) ; also M.Sc., Ph.D. and D.Sc. degrees. B. Eng. awarded for five-year full-time courses ; also M.Eng., M.Eng.Sc., Ph.D. and D.Eng. degrees.

Travelling fellowships and studentships are available to Australian graduates of this university for study in any country.

Opportunities for postgraduate research occur in control systems, meteoric studies by mass spectrometric methods, meteorological physics and low temperature physics.

Wollongong University College, Wollongong, New South Wales. B.Sc. awarded for three-year full-time courses ; B.Sc. (technology) for seven-year part-time courses ; B.Eng. for four-year full-time or six-year part-time courses. Branches include aeronautical, electrical and mechanical engineering.

Opportunities for postgraduate study arise in radio-astronomy, astronomy-photoelectric observations and nuclear physics.

Youth organizations

National Aerospace Organization, 19 Gregory Street, P.O. Box 79, Yagoona, New South Wales. Conducts aerospace education and training.

Austria

National and State academies

Austrian Academy of the Sciences, Ignaz Seipelplatz 2, Vienna I.

Learned societies, professional institutions and other associations

Notring der wissenschaftlichen Verbände Österreichs [Association of Austrian Scientific Societies], Judenplatz 11, Vienna I.

Austrian Meteorological Society, Hohe Warte 38, Vienna XIX.

Austrian Society for Space Research, Postfach 192, Vienna VII/62 (Secretariat: Burg Gasse 28-32, Vienna VII); a member society of IAF.

Austrian Mathematical Society, Karlsplatz 13, Vienna IV.

Austrian Society for Missile Technology, Karlsplatz 13, Vienna IV.

Foundations and trusts

Afro-Asian Institute, Türkenstrasse 3, Vienna IX. Offers scholarships (approximately 40) to students from African and Asian countries. Candidates should preferably be graduates, 18 to 35 years of age. Tenure is nine to twelve months (renewable) at 1,700 schillings per month, plus tuition and book allowance.

Government or official research establishments

Institute of Nuclear Research, Schüttelstrasse 115, Vienna.

Central Meteorological and Geodynamical Station, Hohe Warte 38, Vienna XIX.

Central Library of the Physics Institute of the University of Vienna, Boltzmanngasse 5, Vienna IX/66. Comprises an international collection of publications, specialist and non-specialist, for the understanding of the purposes and potentialities of space activities.

Industrial or commercial research organizations

Österreichische Studiengesellschaft für Atomenergie G.m.b.H. (SGAE) [Austrian Society for Studies in Atomic Energy], Lenaugasse 10, Vienna VIII. The company is owned partly by the Government, partly by State industries and private concerns. It includes the Seibersdorf Atomic Reactor Centre, where research is conducted into meteorites and Institutes of Physics, Electronics, Chemistry, Metallurgy, Health and Biology.

Universities and colleges

The Austrian Committee for Educational Exchange, Türkenstrasse 4, Vienna IX, provides information and publishes handbooks on study facilities in Austria for students from abroad.

The Federal Ministry of Education, Minoritenplatz 5, Vienna I, offers exchange scholarships (55) to nationals of Belgium, Bulgaria, Colombia, China, Denmark, Federal Republic of Germany, Finland, Italy, Japan, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, Turkey, the USSR, the United Arab Republic and Yugoslavia. Candidates must have completed at least four semesters of university study. Scholarships (4) are open to university students from Ethiopia and India, and others (5) to university students from the United Kingdom. Awards are for one year, at 2,000 schillings monthly for undergraduates, 2,500 for graduates.

Scholarships (4) are offered to university students from the United States of America for study at Austrian universities for one academic year (renewable) at 2,600 schillings monthly, plus a travel allowance of 1,400 schillings.

Scholarships (130) are offered to nationals of developing countries for specialized scientific study or research work at educational institutions in Austria. Tenure is nine months, at 2,000 schillings per month for undergraduates and 2,500 for graduates.

Graz University, Universitätsplatz 3, Graz. Institute of Meteorology and Geophysics offers upper atmosphere research and background studies in space exploration.

Innsbruck University, Innrain 52, Innsbruck. Faculty of Natural Sciences offers mathematics, physics, chemistry, meteorology, geophysics and astronomy. Astronomical Institute offers physics of the sun and planetary system, geophysics of astronomy, analysis of orbits of comets and planets. Institute of Theoretical Physics offers plasma physics, orbital theory for rockets, satellites and celestial bodies, reactor physics, quantum theory and relativity. Institute for Computing offers programming and calculations.

Vienna University, Dr. Karl Lueger-ring 1, Vienna. Faculty of Natural Sciences offers mathematics, physics, geophysics, meteorology and astronomy. Institute of Analytical Chemistry and Mineralogic-Petrographic Institute offer meteorite research. Affiliated to the University is the University Stellar Observatory, Türkenschanzstrasse 17, Vienna XVIII.

Graz Institute of Technology, Rechbauerstrasse 12, Graz. Offers mathematics, physics, high frequency techniques, electronics and thermodynamics.

Vienna Institute of Technology, Karlsplatz 13, Vienna. Offers courses in mathematics, physics, nuclear physics, geophysics, electronics and telecommunications. Also a seminar on satellite geodesy. Includes an Aerodynamics Institute.

Belgium

National and State academies

Académie royale des sciences, des lettres et des beaux-arts de Belgique [Royal Belgian Academy of Sciences, Letters and Arts], Palais des Académies, rue Ducale, Brussels. Sections include mathematical and physical sciences and natural sciences.

Royal Flemish Academy of Sciences, Letters and Arts, Paleis der Academiën, Hertogsstraat 1, Brussels. Includes a section of sciences.

Société royale des sciences [Royal Society of Sciences], 7 place du XX août, Liège. Aims at the advancement of the mathematical, physical, chemical, mineral and biological sciences.

Government departments and official agencies

Comité national de recherche spatiale des académies royales belges [National Committee for Space Research

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of the Royal Belgian Academies], Palais des Académies, rue Ducale, Brussels 1. Represents Belgium on COSPAR.

Learned societies, professional institutions and other associations

Association belge des ingénieurs et techniciens de l'aéronautique et de l'astronautique (ABITA) [Belgian Association of Aeronautical and Astronautical Engineers], 20 avenue de la Ramée, Brussels 18. Represents Belgium on IAF and the International Council for Aeronautical Sciences.

Centre belge de vulgarisation aérospatiale [Belgian Centre for Aerospace Popularization], 123 rue Terre-Neuve, Brussels 1.

Centre national d'études et de recherches aéronautiques [National Centre for Aeronautical Study and Research], 11 rue d'Egmont, Brussels 5. Subsidizes aeronautical research.

Société astronomique de Liège [Astronomical Society of Liege], Liège. The society comprises amateur astronomers those aim is to popularize the science.

Antwerp Astronomical Society, 1 Leeuw van Vlaanderenstraat, Antwerp.

Société belge d'astronomie, de météorologie et de physique du globe [Belgian Society for Astronomy, Meteorology and Terrestrial Physics], 3 avenue Circulaire, Uccle, Brussels 18.

Flemish Society for Astronomy, Meteorology, Geophysics and related sciences, Winterstraat 10, Ghent.

Foundations and trusts

Fondation Boghos Nubar Pacha, Œuvre des boursiers arméniens, 11 rue d'Egmont, Brussels 5. Grants are provided for Armenians to study in western Europe: research grants are for 1 or 2 years, with a maximum of $1,000, and other grants are for specialization and for studies in preparation for teaching.

Fonds national de la recherche scientifique [National Foundation for Scientific Research], 11 rue d'Egmont, Brussels 5. The aim of the foundation is to encourage higher education and scientific research in Belgium.

Flemish Scientific Foundation, Koning Albertlaan 69, Kessel-Lo. Scientific research grants are provided for foreign lecturers or scientists to work in Belgium. Duration is from one week to a maximum of six months; there is no fixed amount for the grants.

Government or official research establishments

Centre national de recherches de l'espace (CNRE) [National Space Research Centre], 3 avenue Circulaire, Uccle, Brussels 18.

Institut d'aéronomie spatiale de Belgique [Belgian Institute for Space Aeronomy], 3 avenue Circulaire, Uccle, Brussels 18. Conducts studies in connexion with European space programmes, theoretical and experimental research in physical and chemical processes in the upper atmosphere, solar radiation, its relation to ionospheric and planetary phenomena and magnetospheric phenomena; also prediction of satellite passages.

Institut royal météorologique de Belgique [Royal Belgian Institute of Meteorology], 3 avenue Circulaire Uccle, Brussels 18. Includes departments of meteorology, aerology, terrestrial magnetism, radiation, geophysics, climatology and atmospheric electricity. The Department of Experimental and Theoretical Aerology offers principal courses in celestial mechanics, meteorology, climatology, thermomechanics of the atmosphere and the hydrosphere, with research in models of the atmosphere for numerical weather prediction, utilizing data from meteorological satellites and space probes.

Aviation Museum, Aéroport de Bruxelles-National. Comprises an aeronautical exhibition and aeronautical and astronautical reference books.

Royal Belgian Observatory, 3 avenue Circulaire, Uccle, Brussels 18. Includes time service, positional astronomy, astrophysics, radioastronomy, statistical astronomy, solar activity, geodesy and geodynamics.

Industrial or commercial research organizations

Association belge interprofessionnelle des activités spatiales (Belgospace) [Belgian Interprofessional Association for Space Activities], 21 rue des Drapiers, Brussels 5.

Études techniques et constructions aérospatiales (ETCA), B.P. 197, Charleroi. Engaged in study of satellites, systems engineering for space projects, tracking and guidance; the parent organization is Ateliers de construction électrique de Charleroi (ACEC).

Groupe université-industrie pour le développement des études spatiales (GUIDES) [University and Industry Group for the Development of Space Studies], 66 chaussée de Ruysbroeck, Brussels 19.

European Office of Aerospace Research (EOAR), Shell Building, 47 Cantersteen, Brussels 1.

Universities and colleges

The Ministry for Foreign Affaires and Foreign Trade, Office de la Coopération au Développement, Brussels, offers studentships and post-university course grants in Belgium, to nationals of Burundi, Chad, Congo (Democratic Republic of) Dahomey, Gabon, Guinea, Iran, the Ivory Coast, Libya, Morocco, Nigeria, Rwanda and Senegal for all subjects, and of India and Pakistan for studies in the peaceful uses of nuclear energy. Specialization grants for experienced graduates are for one or two years at 7,000 FB[4] monthly. Studentships are for one to seven years at 5,000 FB and scholarships at 4,300 FB monthly.

The Ministry for National Education and Culture, 67a rue Joseph II, Brussels 4, offers exchange fellowships and studentships in general subjects in Belgium to nationals of Finland, Sweden and Switzerland, as well as of non-European countries, particularly Australia, Canada, Japan and New Zealand. Duration is eight to

[4] Belgian francs.

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twelve months at 5,000 FB or 7,000 FB respectively for undergraduate and graduate studies, plus travel.

Exchange fellowships in science and technology are offered to French nationals of proven research ability, under a reciprocal agreement with CNRS, Paris, France. The agreement is for a total of sixty man-months per year, and awards cover travel, maintenance and research expenses.

Scholarships for study at Belgian universities or other institutions of higher education are offered to members of British universities and colleges, normally for four or eight months' tenure, at 5,000 FB per month, plus travel, books and medical expenses.

For information on fellowships and study grants available to Belgian nationals or students at Belgian universities, see the UNESCO publication, *Study Abroad*. [5]

École royale militaire [Royal Military Academy], 30 avenue de la Renaissance, Brussels, offers mathematics, physics, nuclear physics, geodesy, astronomy and telecommunications.

Faculté polytechnique de Mons [Polytechnical School], rue de Houdain, Mons, offers mathematics, physics, electronics, geodesy and astronomy.

Institut des hautes études de Belgique [Belgian Institute of Advanced Studies], 65 rue de la Concorde, Brussels, has sections of mathematics, mechanics, astronomy, physics, chemistry and natural sciences.

Institut von Karman de Dynamique des Fluides [Von Karman Institute of Fluid Dynamics], 72 chaussée de Waterloo, Rhode-Saint-Genèse, Brussels (see International facilities ; Research establishments, p. 9 above).

State University of Ghent, St. Pietersnieuwstraat 25, Ghent. Faculty of Science and Applied Sciences offers mathematics, physics, astronomy, astrophysics, geodesy, aerodynamics, electrotechnics and telecommunications. Laboratory of Control Techniques offers principal courses in measuring techniques, servomechanisms and electronics, with research in servomechanisms, analogue computation methods and development of computer devices, and studies of problems in rendezvous of space vehicles. Laboratory of Theoretical Electricity offers principal courses in electricity, electrotechnics and measurements, with research in microwaves, magnetism, low-noise microwave amplifiers and lasers.

Free University of Brussels, 50 avenue Franklin Roosevelt, Brussels 5. Faculty of Science offers mathematics, physics, nuclear and atomic physics, terrestrial and celestial physics, and meteorology. Faculty of Applied Science offers electronic physics. The Institute of Aeronautics, affiliated to the Faculty of Applied Science, offers principal courses in theoretical and experimental aerodynamics, turbomachinery, assembly and materials, and control and regulation equipment, with research in basic magnetohydrodynamics and plasma generators. The duration of courses is one year, plus six months for specialization (research project), from admission at master's degree level. The Institute of Astronomy and Astrophysics, affiliated to the Faculty of Science, offers principal courses in theoretical astrophysics, astronomy, geodesy, mathematical astronomy, celestial mechanics, stellar dynamics, space dynamics, orbit calculations, dynamics of plasma in astronomy, radioastronomy and space research methods, with research in astrophysics, astronomy and radioastronomy. The Institute of Physics is affiliated to the Faculty of Science. The Institute of Telecommunications and Acoustics is affiliated to the Faculty of Applied Science. Studentships for one academic year are offered to students from Luxembourg.

University of Liège, Place du XX août 7, Liège. Faculty of Science offers mathematics, physics and astronomy. Faculty of Applied Science, Department of Aeronautics, Structures and Aeroelasticity, offers principal courses in aeronautics, fluid mechanics, vibrations, structures, exterior ballistics and dynamics of rockets, radio tracking and telemetry, with research in optimal trajectories and perturbations, optimization of control problems, characteristic modes of vibration of a structure such as a multi-stage rocket, numerical programming of matrix calculations for complex structures and theoretical studies of the dynamics of orbital rendezvous. Scientific services attached to the faculty of science include the Institute of Physics (quai Franklin Roosevelt 1A) ; the Institute of Mathematics (15 avenue des Tilleuls) ; the Institute of Astronomy and Geodesy (Cointe-Sclessin) and the Institute of Astrophysics (Cointe-Sclessin). The last-named offers principal courses in astrophysics, spherical astronomy, optics and spectroscopy and supplementary courses in applied spectroscopy, thermodynamics, hydrodynamics, acoustics, electronics, mathematical and physical astronomy, celestial mechanics, modern physics and the electronic and dynamic structure of molecules. Research activities, in connexion with European space programmes, are in far-ultra-violet and infra-red radiations, micrometry and micro-intensitometers, and installation of space telescopes. Theoretical studies are conducted in the orbiting of artificial satellites, predictions of ultraviolet and infra-red spectra of comets and aurorae, shock waves in plasmas, and light polarization in the galaxy. Plans are under consideration for using sounding rockets and small satellites in these studies.

Catholic University of Louvain, 4 rue Kraken, Louvain. Faculty of Science offers mathematics, physics, geodesy, astronomy (Astronomical Institute, 61 Naamse Straat, Louvain), and meteorology. Institute of Chemistry offers principal courses in analytical chemistry, physical chemistry and spectrochemistry, with research in combustion and ionization in flames, chemical reactions in plasmas, and conversion of light into electrical energy. Faculty of Applied Science offers principal courses in fluid mechanics, mechanical vibrations and control techniques, with research in guidance and automatic piloting of space vehicles, satellite stabilization (piloting devices, retrosystems, perturbations) and work on the passive stabilization of satellite attitude.

Exchange studentships for nine or ten months, covering tuition, maintenance and travel, are available to graduates of Cologne University, Federal Republic

[5] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

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of Germany, any of the establishments under the Higher Council for Scientific Research, Spain, and Genoa University, Italy.

Brazil

National and State academies

Brazilian Academy of Sciences, Caixa Postal 229, ZC-00, Rio de Janeiro.

Government departments and official agencies

National Commission for Space Activities (CNAE), São José dos Campos, São Paulo. The commission comes under the National Research Council which controls the central Space Physics Laboratories at São José dos Campos.

Regional Meteorological Institute, Ministry of Agriculture, Pôrto Alegre.

Meteorological Institute, Edifício do Entreposto Federal da Pesca, Praça 15 de Novembro 2, 50 a, Rio de Janeiro.

Learned societies, professional institutions and other associations

Regional Institute of Aeronautical Sciences, Ourinhos.

Brazilian Society of Aeronautical Law, Avenida Ipiranga 84, São Paulo. Publishes the *Revista Brasileira de Direito Aeronâutico* [Brazilian Review of Aeronautical Law].

Scientific Society of São Paulo, Caixa Postal 1904, São Paulo. Includes a Department of Astronomy.

Brazilian Interplanetary Society, Caixa Postal 6450, São Paulo.

Government or official research establishments

Brazilian Centre for Physics Research, Av. Wenceslau Braz 71, ZC.82, Rio de Janeiro. Formerly engaged in work related to space science.

Latin-American Physics Centre, avenida Wenceslau Braz 71, Rio de Janeiro, Gb. Offers one-year fellowships for the development of physics in Latin American countries by research, postgraduate courses for higher degrees and advanced physics teaching courses for university lecturers. Candidates should be appropriately qualified and be fluent in Portuguese, Spanish, French or English.

Aeronautics Technical Centre, São José dos Campos, São Paulo. This is a Ministry of Aeronautics fundamental research centre, with an Institute of Research and Development which includes development and testing of small sounding rockets, and an Institute of Aeronautical Technology which offers a five-year programme in electronic, mechanical and aeronautical engineering, and has a graduate school up to master's degree level.

Institute of Pure and Applied Mathematics, Rua São Clemente 265, Rio de Janeiro, Gd. Offers, through the National Research Council, fellowships for courses in mathematics at the institute, to holders of master's degrees in mathematics. Candidates may be from any country. In certain cases, recipients of fellowships may be required to undertake some teaching. Tenure is one academic year, and the amount of the award is variable, normally covering travel, board and lodgings, tuition and books.

Institute of Marine Research, Rua Ipirú, Praia da Bica, Ilha do Governador, Rio de Janeiro. Engages in work related to space science.

Laboratories of space physics of CNAE, São José dos Campos, São Paulo, offer postgraduate courses in space subjects related to research carried out at the laboratories. Space science research projects in operation or preparation include transequatorial measurements of the composition of the ionosphere by means of satellite signals, atmospheric noise, measurement of ionospheric absorption by the cosmic noise method, vertical soundings with ionosondes, measurement of variation of the earth's magnetic field, meteorological satellites for very low frequency observations of the lower atmosphere, a small sounding rockets programme, and experiments in circumterrestrial radiowave propagation. International co-operative projects are conducted with NASA of the United States, Stanford University, United States, the Cambridge research laboratories of the United States Air Force, the National Space Research Commission of Argentina, the University of Tucuman, Argentina, and Concepcion University, Chile. A sounding rocket programme is carried out from the Barreira do Inferno launch site near the magnetic equator, operated by the Ministry of Aeronautics in co-operation with CNAE. The programme includes co-operative sounding rocket projects with the Goddard Space Flight Centre of NASA in the United States, for the evaluation of cosmic-ray effects on the lower D region of the ionosphere and the measurement of wind, temperature, pressure and density, using the grenade technique. The laboratories co-operate in an inter-American experimental meteorological sounding rocket network (EXAMETNET), at present with the United States and in the near future with other countries. Other programmes include project RASA for three ground stations spanning the geomagnetic equator for special studies of the equatorial ionosphere, using Faraday rotation, differential Doppler and group delay techniques of analysing signals from United States satellites, galactic X-ray sources in the southern hemisphere, EUV fluxes in the night sky, and testing of the Federal Republic of Germany/United States satellite. During 1966, a total of fifty-one sounding rockets were launched by CNAE in co-operative programmes, including nineteen rockets from a temporary launching site in southern Brazil for the total eclipse of the sun on 12 November 1966.

Rio de Janeiro National Observatory, Rua General Bruce 586, Rio de Janeiro. The observatory includes two magnetic observation stations, at Tatuoca and at Vassouras, and a seismological station ; it is engaged in work related to space sciences.

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Universities and colleges

Pontifical Catholic University of Rio de Janeiro, Rua Marquês de São Vicente 209, Rio de Janeiro. Mathematics Department offers celestial mechanics. Exchange studentships are offered to all countries whose Governments or universities offer reciprocal arrangements. Tenure is one academic year.

Pontifical Catholic University of São Paulo, Rua Monte Alegre 984, São Paulo. Offers celestial mechanics.

Brasília University, Brasília, D.F., Apt. 15. Includes Faculties of Mathematics, Physics and Biology. The University Foundation offers studentships to nationals of all countries. Tenure is one academic year (renewable for one year) at $2,440, plus tuition expenses.

Mackenzie University, Rua Maria Antónia 403, São Paulo. Engaged in work related to space research. The Engineering School offers topography, astronomy and geodesy.

Para University, Ave. Nazaré 61, Belem-Pará. School of Engineering offers astronomy.

University of Rio Grande do Sul, Avenida João Pessoa, Porto Alegre, Rio Grande do Sul. Faculty of Philosophy, Department of Physics, offers celestial mechanics. Exchange studentships are offered to university students from certain Latin American countries ; tenure is one academic year, covering study expenses.

São Paulo University, Cidade Universitária "Armando de Salles Oliveira", Caixa Postal 8191, São Paulo. Its Astronomical and Geophysical Institute is engaged in work related to space science. Fellowships (15) are offered to graduate nationals of all countries for advanced courses and research, preferably to candidates for careers in higher education, fluent in Portuguese, French or English ; age limit 35 years. Tenure is one year, at 150,000 cruzeiros per month, with free tuition.

The Ministry for Foreign Affairs, Rio de Janeiro, offers grants for study in Brazil in all subjects as follows : under the Brazil-Mexico cultural exchange agreement, to nationals of Mexico (lecturers, research workers and students) for six to nine months at $85 per month ; to nationals of the United Kingdom (graduates, preferably speaking some Portuguese) for six months at $100 per month ; to nationals of Argentina (teachers, graduates and research workers) for three to nine months at $85 per month ; to nationals of other Latin American countries (graduates, preferably speaking some Portuguese) for four to six months at $85 per month ; to nationals of the United States of America (students) for ten months, covering maintenance and tuition, and to students of Ghana, Nigeria and Senegal (graduates) for six months at $85 per month.

National Research Council, avenida Marechal Câmara 350-60, Rio de Janeiro, Gb., offers research fellowships to nationals of Brazil and other countries for studies in fields including physics, mathematics, biology, geology, chemistry and technology. Grants are available also to Brazilian scientific institutions which wish to receive visits from highly qualified foreign scientists. Exchange scholarships in scientific research are offered to nationals of Italy : maximum tenure is three months.

Bulgaria

National and State academies

Bulgarian Academy of Sciences, "7 Noemvti" 1, Sofia. Department of Physics and Mathematics includes the Institute of Physics and Atomic Research Station, Institute of Electronics, Mathematical Institute and Computing Centre, Institute of Geophysics, Institute of Meteorology and the astronomy section. Publications include *Astronâmiceski Kalendar.*

Learned societies, professional institutions and other associations

Astronautical Society of Bulgaria, Tolbuhin 18, Sofia. Publishes the *Astronavtika.* A member society of IAF.

Society of Physicists and Mathematicians, Mathematical Institute, Anton Ivanov 1, Sofia.

Government or official research establishments

Astronautics section and National Astronomical Observatory " Y. A. Gagarin ", Stara, Zagora, offers regular courses in astronomy and observation of the earth's artificial satellites, and in rocket technology and model rocket construction. There is a regular seminar in astronomy. Practical courses are provided for both teachers and students. The regular courses include spherical astronomy, astrophysics, optics and astronomical optics, radioastronomy, meteorology, photography and astrophotography, reaction propulsion theory, rocket dynamics and fuels. Lecture series, with films, are provided for the general public ; manuals and handbooks have been published.

Universities and colleges

The Government offers studentships, under the United Nations programme, to students from territories administered by Portugal, non-autonomous countries and South West Africa, for university courses in Bulgaria. Tenure is for the duration of studies, plus one year to learn Bulgarian, with maintenance and travel.

The Ministry of Education offers bursaries for advanced studies in Bulgaria to nationals of countries with which there are exchange agreements. Bursars are lodged and receive an expense allowance.

Scholarships for study and research in Bulgaria are offered to British postgraduate students with some knowledge of Bulgarian. Tenure is nine months, and allowances cover maintenance, lodgings and tuition. Grants are made towards books, travel and other expenses.

Exchanges for scientific and technological personnel, university staff and postgraduate students have been agreed with the British Council, 65 Davies Street, London W.1., England.

Higher Pedagogical Institute, Plovdiv. Offers astronomy and astrophysics.

Institute of Electrical and Mechanical Engineering, rue du 19-Fevrier 1, Sofia. Offers theoretical mechanics, construction mechanics, aerodynamics, hydrodynamics, jet propulsion, radioelectronics, electrical engineering, communications and higher mathematics.

University of Sofia, Boulevard Ruski 15, Sofia. Faculty of Physics offers astronomy and astrophysics, hyperfrequency radiophysics, dynamic meteorology and physics of the upper atmosphere ; Department of Mathematics offers analytic mechanics, computation and programming.

Burma

Government departments and official agencies

Burma Meteorological Department, New Secretariat Building, Rangoon.

Government or official research establishments

Union of Burma Applied Research Institute, Kanbe, Yankin P.O., Rangoon. Includes Departments of Physics, Engineering and Instrumentation Research.

Universities and colleges

Burma Institute of Technology, Rangoon. Founded 1961 and established with aid and loan of teaching staff from the USSR.

Mandalay Arts and Science University, Mandalay. Faculty of Science offers physics and mathematics.

Rangoon Arts and Science University, University Estate, Rangoon. Offers physics and mathematics. Scholarships are available to students and university teachers from the USSR and Yugoslavia for study in any field. Awards cover maintenance and tuition for the duration of the course, books and travel.

Rangoon Institute of Technology, Gyogon, Rangoon. Offers various engineering subjects, including electrical and electronic engineering.

Workers' University, Botataung Pagoda Road P.O., Rangoon. Provides university education for adult workers, leading to the examinations and degrees of the Rangoon Arts and Science University, offering mathematical and scientific subjects.

Colombo Plan scholarships and training awards are available to nationals of Australia, Brunei, Cambodia, Ceylon, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the Philippines, the Republic of Viet-Nam and Thailand. Awards are for study in Burma, in fields determined through bilateral negotiations of the Governments concerned. Awards cover maintenance, travel and tuition.

Scholarships under the United Nations programme are offered to students from Non-Self-Governing and Trust Territories and South West Africa. Tenure is up to two years for graduates, three years for others, and awards cover tuition and maintenance.

Canada

National and State academies

Royal Society of Canada, National Research Building, Ottawa 2, Ontario.

Government departments and official agencies

Atomic Energy of Canada Ltd., 150 Kent Street, Ottawa 4, Ontario. Conducts research into the practical uses of atomic energy.

National Research Council post-doctoral fellowships are available at the following establishments :

Pure and Applied Physics Laboratory, Chalk River, Ontario : nuclear physics, theoretical physics and cosmic ray studies ;

Reactor Physics and Engineering Laboratory, Chalk River : new reactor concepts, plasma and accelerator physics ;

Chemistry Laboratory, Whiteshell, Pinawa, Manitoba : radiation chemistry ;

Metallurgy Laboratory, Chalk River : radiation damage of metals and semi-conductors at liquid helium temperatures, effects of neutron irradiation on physical properties of materials.

Canadian National Committee on Space Research, c/o Dr. D. C. Rose, National Research Council (NRC), 100 Sussex Street, Ottawa, Ontario. This is an associate committee of NRC, forming a consultative group on space science problems and co-ordinating the rocket experiments conducted by government departments and university groups in Canada. Represents Canada on COSPAR.

Department of Mines and Technical Surveys, Ottawa. Conducts a co-operative programme with the United States Coast and Geodetic Survey of the United States Department of Commerce. A system of eight satellite triangulation stations has been established to receive transmissions from the United States geodetic survey satellites.

Department of Transport/Meteorological Service of Canada, 315 Bloor Street West, Toronto 5. Includes a Research and Training Division. National Research Council post-doctoral fellowships are tenable at the Toronto laboratories for physical, dynamic and synoptic meteorology, including upper atmosphere meteorology, solar-terrestrial relationships and meteorological satellite data analysis. Two meteorological satellite read-out stations have been built. There is also a meteorological rocket programme.

National Aeronautical Research Committee, 100 Sussex Drive, Ottawa, Ontario.

National Research Council (NRC), Ottawa 7, Ontario. Divisions include the National Aeronautical Establishment, Pure Physics, Applied Physics, Mechanical, Radio and Electrical Engineering and Biosciences. Space Research Facilities Branch administers the Churchill Research Range at Fort Churchill, Manitoba, founded and used jointly by NRC and NASA of the United States. This fully instrumented cold-weather range is situated

near the zone of maximum auroral activity. From here, Canadian and United States rockets are launched. The minitrack station near St. John's, Newfoundland, engages in satellite tracking and telemetry. The cosmic ray section of NRC has a programme of study of charged particles associated with auroral events, using rocket-borne detectors, and with the outer radiation belt using data from Alouette satellites. The upper atmosphere research section of NRC uses rockets to obtain data on electron density and temperature and micrometeoroids, and maintains a radar meteor patrol at Springhill Meteor Observatory. The space electronics section of NRC carries out the instrumentation of the research rockets.

Post-doctoral fellowships awarded by the Council in 1966-1967 numbered approximately 120, of which 60 were tenable in its own laboratories, 17 in laboratories of the Department of Mines and Technical Surveys, 2 in the Department of Transport/Meteorological Service and 18 in the laboratories of Atomic Energy of Canada Ltd. Candidates for fellowships should be under 35, with a Ph.D. degree of a recognized university or equivalent research experience. There are no restrictions regarding nationality, but candidates must meet all Canadian immigration requirements. The annual stipend is $6,000,[6] tax free, with travel grants. Tenure is for one year, renewable. Applications and inquiries should be addressed to the Awards Officer, National Research Council, Ottawa 7, Canada. Research topics available include the following:

Division of Pure Physics, Ottawa: spectroscopy, molecular beams, cosmic rays, high energy physics, plasma physics and solid state physics;

Division of Applied Physics, Ottawa: optics, interferometry, lasers, X-rays and nuclear radiations;

Division of Mechanical Engineering, Ottawa: hybrid computation, control theory, automatic control, shock waves in gases, magnetohydrodynamic flow stability and fluid mechanics;

National Aeronautical Establishment, Ottawa: metallurgy, fatigue, creep, high temperature materials, structural analysis, systems, flight mechanics, stability and control, aeromagnetics, geomagnetics and hypersonics.

Learned societies, professional institutions and other associations

Association canadienne française pour l'avancement des sciences, Inc., C.P. 6060, Montreal 3. Comprises French-Canadian learned societies aiming at the popularization of science by publications, lectures and awards.

Canadian Aeronautics and Space Institute (CASI), Commonwealth Building, 77 Metcalfe Street, Ottawa 4, Ontario. Formed for the advancement of aeronautics and space research.

Canadian Association of Physicists, c/o Department of Physics, McMaster University, Hamilton, Ontario.

Canadian Mathematical Congress, 985 Sherbrooke Street West, Montreal, Quebec. Offers awards to students and lecturers in mathematics from all countries to attend the Summer Research Institute at Kingston, Ontario, and other meetings and summer schools in Canada or abroad.

Canadian Society of Exploration Geophysicists, Scholarship Sub-committee, P.O. Box 117, Calgary, Alberta, offers four scholarships in geophysics or closely related fields to applicants from most countries for study at Canadian universities. Tenure is one year (renewable for four years), at $500.

Institut scientifique franco-canadien, 2900 Mount Royal Boulevard, Montreal 26. Provides lectures by French scientists for Laval University and the University of Montreal.

National Aviation Museum, Ottawa International Air Terminal, c/o National Museum of Canada, McLeod and Metcalfe Streets, Ottawa.

Nova Scotian Institute of Science, P.O. Box 1522, Halifax, Nova Scotia.

Royal Astronomical Society of Canada, 252 College Street, Toronto 2B. Includes sixteen active centres.

Royal Canadian Institute, 191 College Street, Toronto. Promotes research and publication in the physical sciences.

Government or official research establishments

Astronomical Observatory, Quebec. Operated by the Quebec Centre of the Royal Astronomical Society of Canada, with the co-operation of the provincial government.

Canadian Armament Research and Development Establishment, Valcartier, Quebec, an establishment of the Defence Research Board. Conducts investigations of the stratosphere and ionosphere.

Defence Research Telecommunications Establishment, Ottawa, Ontario, an establishment of the Department of National Defence. Activities include research on radio propagation problems, auroral research and various telecommunications investigations, data being acquired from rocket probes launched at Churchill research range and from the Alouette satellites launched by NASA in the United States. The establishment is now responsible for the design and development of the space craft for the next joint Canadian-United States satellite programme, International Satellites for Ionospheric Studies (ISIS).

Dominion Astrophysical Observatory, Victoria, British Columbia. National Research Council post-doctoral fellowships are available for research in galactic structure, spectroscopic binaries, stellar atmospheres and interstellar matter.

Dominion Observatory, Ottawa, Ontario. Includes Divisions of Geomagnetism, Positional Astronomy, Stellar Physics, Gravity and Seismology. National Research Council post-doctoral fellowships are available for meridian astronomy, solar spectroscopy, meteoric astronomy, radio astronomy, theoretical astrophysics, magnetic variation, gravity measurement and seismology.

[6] The currency referred to throughout this section is the Canadian dollar.

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Dominion Radio Astrophysical Observatory, Penticton, British Columbia. National Research Council postdoctoral fellowships are available for research in hydrogen line and continuum studies of the galaxy and extragalactic nebulae.

National Aeronautical Establishment, Montreal Road and Uplands Airport, Ottawa, Ontario. Undertakes flight research, meteorology.

Industrial or commercial research organizations

RCA Victor Co., Ltd. Research Laboratories, Montreal. Engaged in space research projects to contracts placed by Canadian and United States government agencies. Laboratory studies in plasma physics include simulation of the interaction of the solar wind with the magnetosphere, antenna properties in the presence of anisotropic ionized media and satellite perturbations and their effect on probe measurements.

Universities and colleges

Basic scientific and engineering disciplines necessary to give background training in space research are taught in a large number of universities in Canada. In eastern Canada, the instruction in some of the universities is in French and in some universities either French or English may be used; in central and western universities the instruction is in English. Several graduate schools offering master's and doctor's degrees have research groups carrying out space research programmes using rockets, high altitude balloons, related laboratory work, or ground observation of the aurora and upper atmosphere.

Foreign students who meet the entrance requirements are accepted in Canadian universities on terms arranged with the university. Information on fellowships and scholarships available at Canadian universities and colleges may be obtained by writing to them direct or to the Association of Universities and Colleges of Canada, 75 Albert Street, Ottawa 4, Canada.

Commonwealth scholarships (250) for degree courses at Canadian universities are available to Commonwealth citizens domiciled in a Commonwealth country other than Canada; awards are intended for postgraduate study but may be used for first degree courses in special cases. The age limit is usually 35. Tenure is normally two years, at $165 per month for graduates and $150 for undergraduates, with certain additional grants. Applications should be made through the agency of the Commonwealth Scholarship and Fellowship Plan in the candidate's country.

Commonwealth fellowships, tenable at any Canadian university or educational agency, are intended to bring to Canada from other Commonwealth countries scholars of established reputation and persons prominent in the field of education. Research fellowships (3) are normally for one academic year and visiting fellowships (5) for two to four months.

Canadian university scientists may include provision for support of post-doctoral fellows when submitting applications for National Research Council operating grants.

Information on opportunities for Canadian graduates to continue their studies in other countries is contained in the UNESCO publication, *Study Abroad*. [7]

Acadia University, Wolfville, Nova Scotia. Includes Faculties of Science and Applied Science and an astronomical observatory. The following entrance scholarships are open to students from all countries: (*a*) Acadia University entrance scholarships (4), for four years at $500 per annum; (*b*) Margaret M. Reid Scholarship at $800, and (*c*) Acadia New England Alumni Association scholarship at $210.

Assumption University of Windsor, Windsor, Ontario. Includes Faculties of Arts and Sciences, Applied Science and Graduate Studies. Graduate fellowships in fields including mathematics, physics and engineering are available to nationals of all countries. Candidates must hold a bachelor's degree or equivalent, and be accepted by the committee on graduate studies. Certain departmental duties and a limited amount of teaching are required. Tenure is one year, at $500 to $2,000.

Carleton University, Ottawa 1, Ontario. Includes Faculties of Science and Engineering. Aerospace studies are offered.

Dalhousie University, Halifax, Nova Scotia. Includes Faculties of Arts and Sciences and Graduate Studies. Graduate fellowships are available to nationals of all countries with a first or second class honours bachelor's degree, tenure one year, renewable, at $2,000 for first year and $2,750 subsequently. Fellowships for study at the university open to nationals of all countries include (*a*) fellowships for graduates from a recognized university, tenure eight to twelve months, at $2,000 to $3,600; (*b*) fellowships for holders of Ph.D. degrees for post-doctoral studies (fields include physics, mathematics, engineering and geophysics); tenure one year, renewable for two years, at $6,000 tax free, plus research and travel grants. Other scholarships and fellowships are available to Canadian nationals resident abroad.

Laval University, C.P. 2208, Bureau principal, Quebec, P.Q. Offers astronomy, physics, optics, electromagnetics, atomic and nuclear physics. The usual language of instruction is French. Scholarships include six for Asian students, at about $400 for study expenses, with maintenance grants, and four awarded on a reciprocal basis agreed with France, the Federal Republic of Germany, Spain and Switzerland.

McGill University, Montreal 2, P.Q. Includes Faculties of Arts and Science, Law, Engineering and Graduate Studies and Research. Space Research Institute has a high altitude project in collaboration with the United States Army, using gun-launched vehicles for E-layer investigations. Experimental rocket booster vehicles are used for engineering research and development. There is a Hypersonic Propulsion Laboratory. The Research Institute for International Air and Space Law offers preparation for the master's degree, LL.M., and for the diploma in air and space law. Meteorology De-

[7] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

partment offers M.Sc. degrees after one year's resident graduate study, thesis and examination, and Ph.D. degrees after three years' graduate study in meteorology.

Fellowships for courses in the Faculty of Graduate Studies and Research include an exchange fellowship for a graduate of Glasgow University, for one year at $500, plus travel, maintenance and tuition, and Harold H. Helm fellowships for graduates from Princeton University, United States, for one year (renewable) at $1,400 to $1,800, plus fees. Awards available to nationals of all countries for graduate studies, research or training in scientific fields include Varian Associates of Canada Ltd. fellowships for physics, open to Ph.D. candidates, tenure one year at $2,400, and David Stewart memorial fellowship for physical science, for one year (renewable) at $1,400 to $1,800, plus tuition.

Queen's University, Kingston, Ontario. Includes Faculties of Arts and Science and Applied Science and School of Graduate Studies. Mathematics Department offers astronomy for the doctorate.

Fellowships include the R. Samuel McLaughlin fellowships available to nationals of all countries: (*a*) resident fellowships (12) in engineering, sciences and other fields for candidates with honours bachelor's degrees, tenure one year, renewable at $1,200 to $1,500; (*b*) teaching fellowships (2) in mechanical engineering, tenure two years, renewable, at $1,100 per annum. An exchange scholarship is available to a student of St. Andrews University, Scotland.

Saint Mary's University, Halifax, Nova Scotia, offers courses in astronomy.

University of Alberta, Calgary, Alberta. Includes Faculties of Arts and Science and Engineering. Affiliated colleges include the Southern Alberta Institute of Technology, Calgary. Department of Physics includes space research and courses in astronomy and astrophysics. Research projects include rocket and balloon investigations of cosmic radiation and auroral phenomena. Graduate awards available to nationals of all countries include: (*a*) Province of Alberta graduate scholarships (18) for students in any year of graduate study, usually at $2,500; (*b*) Province of Alberta and other graduate fellowships (5) for Ph.D. students who have completed a year of graduate study, at $3,600; (*c*) graduate research assistantships (125) of $2,300 to $2,700 plus travel grants, and (*d*) graduate teaching assistantships (300), open only to candidates holding at least the equivalent of a Canadian B.Sc. degree.

University of Manitoba, Winnipeg 19, Manitoba. Includes Faculties of Arts and Science, Engineering and Graduate Studies and Research; also Department of Mathematics and Astronomy. Fellowships offered to nationals of any country to work for a master's degree in any department or a Ph.D. in fields including physics are: (*a*) graduate fellowships (30) open to candidates already working towards a degree; (*b*) University of Manitoba teaching assistantships, one year at $2,000 to $3,000. Fellowships available to graduates of recognized universities to enable them to undertake research (perfect knowledge of English is essential) are: (*a*) Northern Electric Co., Ltd., research fellowship at $1,500 open to a Canadian or British citizen or landed immigrant, for research in electrical engineering, physics, mathematical physics or physical chemistry; (*b*) Shell Canada Ltd., research fellowship at $2,250 for chemistry, physics, engineering, geology or geophysics, open to graduates in science or engineering from approved Canadian universities.

University of Montreal, C.P. 6128, Montreal 3, Quebec. Department of Physics includes space research, radio frequency probe development, and courses on nuclear astrophysics. Fellowships, offered by the university include: (*a*) 15 study awards to nationals of any country with a good knowledge of French admitted by the faculty of their choice, tenure one year, renewable; (*b*) five study awards to nationals of any country having a good knowledge of French and research training which could lead to a master's degree or doctorate, tenure one year, renewable, at up to $1,000, plus $500 travel expenses.

University of Saskatchewan, Saskatoon, Saskatchewan. Includes Faculties of Arts and Science, Engineering and Graduate Studies. Department of Physics, Institute of Upper Atmosphere Physics, conducts space research by rocket and balloon-borne experiments. Investigations include auroral-zone electric fields in the E region, airglow measurements and spectroscopic studies of aurora. Fellowships available to nationals of all countries holding a bachelor's degree and eligible for admission to a higher degree course include: (*a*) graduate assistantships (25) in the natural sciences, engineering and other fields, tenure one year, at $1,800; (*b*) Government of Province of Saskatchewan graduate research scholarships for scientific and industrial research, tenure one year, at $2,000 to $2,400.

University of Toronto, Toronto S, Ontario. Includes Faculties of Arts and Science, Applied Science and Engineering. David Dunlap Observatory, Richmond Hill, Ontario, contains a 74-inch reflecting telescope, the largest in Canada, equipped for spectrographic, photographic and photoelectric studies in astronomy. A 19-inch telescope is equipped for photoelectric work. Radio telescopes and receivers are also used. Research is also conducted at the Algonquin Radio Observatory and the Institute of Computer Science. The M.A. degree is offered for two years' graduate study and the Ph.D. for a three years' course and thesis in astronomy.

Institute of Aerospace Studies, Steeles Avenue and Duffering Street, Toronto. Trains scientists and engineers in space research. Work includes upper atmosphere physics, with measurement of density, temperature and pressure in the lower ionosphere using rocket-borne sensors flown from Churchill Research Range, development of micrometeoroid impact gauge, mechanics of gases and plasmas, propulsion, hypervelocity launchers, dynamics and gasdynamics of flight in the atmosphere and in space, molecular beam simulation of space aerodynamics, design and analysis of flight structures. Research facilities are offered in these subjects. The M.A.Sc. degree may be taken in a one-year graduate course in aerospace engineering sciences, including nuclear engineering, and the Ph.D. in a three-year graduate course in aerospace engineering sciences.

Fellowships and grants include the following: (*a*) open fellowships available to nationals of all countries who have an excellent academic record, for one year, at up to $2,500, plus part fees; (*b*) S. Ubukata fund for Japanese students who are admissible to the university, for one year, renewable; (*c*) admission scholarships (3) for any first degree course for nationals of any country; candidates must have the entrance requirements with first-class standing; tenure up to four years, at $200 to $1,500.

University of Victoria, Victoria, British Columbia, offers courses in astronomy and astrophysics. The Dominion Astrophysical Observatory is nearby.

University of Waterloo, Waterloo, Ontario. Includes Faculties of Science, Engineering and Graduate Studies. Teaching fellowships, teaching and research assistantships are open to nationals of all countries who are qualified graduates wishing to study for a master's or doctor's degree. Tenure is one year, at up to $275 per month.

University of Western Ontario, London, Ontario. Includes Faculties of Arts and Science, Engineering Science and Graduate Studies; Department of Mathematics (pure and applied) and Astronomy. The honours M.A. degree and the Ph.D. may be taken in mathematics and astronomy, including statistical astronomy, galactic structure, astrophysics, stellar structure, interstellar matter and stellar atmospheres. The Department of Physics offers courses in astrophysics and radio physics of the upper atmosphere and troposphere; also geophysics. Space research interests include laboratory astrophysics and study of ionospheric inhomogeneities using rockets.

Fellowships available to first-class honours graduates of a recognized university are: (*a*) Canadian Industries Ltd. graduate fellowships (10) in chemistry, available to British nationals with a B.Sc. or M.Sc. degree in chemistry; reading knowledge of French and German essential; tenure usually one year, renewable, at $2,000; (*b*) California Standard Company fellowships in geology and geophysics, tenure one year, at $1,000; (*c*) fellowships in fields including sciences available to a postgraduate student of the University of London; recipient to assist in demonstrating; tenure one year, renewable, at $2,000.

York University, 2275 Bayview Avenue, Toronto, Ontario. Affiliated to the University of Toronto. Department of Physics and Chemistry includes space research programmes offering opportunities to work for higher degrees.

Ceylon

Government departments and official agencies

Ceylon Meteorological Service, Bullers Road, Colombo 7; the government department of meteorology, controlling Colombo Observatory.

Government or official research establishments

Ceylon Institute of Scientific and Industrial Research, 363 Bullers Road, Colombo 7. Includes radio communication and ionosphere research.

Colombo Observatory, Bullers Road, Colombo 7. Has astronomy, meteorology, climatology and seismology services; conducts radar, wind and radiosonde observations.

Universities and colleges

University of Ceylon, Peradeniya and Colombo. Offers mathematics and physics. Faculty of Engineering includes electrical and mechanical engineering.

The Hilda Obeysekera fellowship for research is open to a graduate from any country; tenure is three years at 4,800 rupees per year.

Colombo Plan scholarships in engineering are available to nationals of South Asian countries, age 17 to 23. Tenure is two years at 4,800 rupees annually, plus travel and tuition.

Scholarships under the United Nations programme are open to students of Non-Self-Governing Territories for the study of engineering in Ceylon: age limit, 22. Tenure is one year, and awards cover maintenance, travel and certain other expenses. For information on fellowships and study grants available to nationals of Ceylon, see the UNESCO publication *Study Abroad*.[8]

Chile

Government departments and official agencies

Oficina Meteorológica de Chile [Meteorological Bureau], Casilla 717, Santiago. Stations include three radiosonde observatories, one geomagnetic observatory in Easter Island, and six atmospheric radioactivity observatories.

Foundations and trusts

Education Foundation of the Valparaiso Rotary Club, Casilla 2047, Valparaíso.

Loans (approximately 10) are offered for continuation of studies: (*a*) for Chilean students to study in Chile or other countries; (*b*) in certain cases, for nationals of South American countries without sufficient financial means to complete their studies, to attend Chilean universities.

Intercambio Cultural Estudiantil Americano (ICEA) [American Student Exchange], Ahumada 131, oficina 917, Santiago.

Exchange studentships are offered to students of universities in Chile and other countries; also available to professionals in Latin American countries. Tenure is one month, three months or one semester.

Grants (10) for study in summer schools of Chilean universities are offered especially to university students and professionals of Latin American countries.

[8] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Observatory of the Catholic University of Chile, Casilla 6014, Santiago.

National Astronomical Observatory, Casilla 36-D, Santiago.

Salto Observatory, Casilla 130, Santiago. Includes solar, meteorological, bio-climatological, geophysical, magnetic and seismological sections.

UNIVERSITIES AND COLLEGES

The Chilean Commission for Intellectual Co-operation, Huérfanos 1117, oficina 328, Santiago, has an information service for persons from other countries who wish to study in Chile.

The Ministry for Public Education, Avenida Bernardo O'Higgins 1371, Santiago, operates exchange scholarships for nationals of any country for study in the universities of Santiago.

The Ministry for External Relations, Santiago, administers two studentships of the Inter-American Convention for the Promotion of Cultural Interchange. They are for nationals of the United States of America for study in Chile. Tenure is nine months, at 100 escudos monthly, with a travel grant from the United States Government.

For information on fellowships and study grants available to nationals of Chile and students at Chilean universities, see the UNESCO publication, *Study Abroad.*[9]

Catholic University of Chile, Av. Bernardo O'Higgins 340, Casilla 114-D, Santiago. Faculty of Juridical, Political and Social Sciences offers air law. Studentships (5 for each country) are offered to nationals of Latin American countries; tenure one year. One-year exchange fellowships are offered to professors and students of foreign universities.

University of Chile, Av. Bernardo O'Higgins 1058, Casilla 10-D, Santiago. Has Faculty of Physical and Mathematical Sciences.

Scholarships and study loans include approximately 34 loans available to graduates of other universities and to professionals. Scholarships are offered to nationals of Argentina (2), El Salvador (3), the Federal Republic of Germany (1), Haiti (4), Japan (1), the People's Republic of China (3), Peru (3) and the United States of America (1). Cultural Convention exchange studentships are offered to Czechoslovakian students. Grants for vacation courses (three weeks in January) are available to students from other countries.

Concepción University, Casilla 297, Concepción. Faculty of Philosophy offers cosmography; Faculty of Engineering offers thermodynamics and electronics. A studentship is offered to an applicant under 25 years of age from a Latin American country, for completion of studies in engineering. Tenure is six years.

Universidad Técnica del Estado [State Institute of Technology], Avenida Ecuador 3467, Correo 2 Santiago. Includes Faculties of Mathematics, Physics and Chemistry, Electricity, Mechanics and Civil Engineering. Studentships (12) for specialization in the different schools of the institute are offered, in certain cases, to qualified nationals of any country.

Universidad Técnica " Federico Santa María ", Casilla 110-V, Valparaíso. Offers electronics and telecommunications. There is a Graduate School. Research grants are offered to nationals of Chile and other Latin American countries. For research in electrical and chemical engineering, candidates must be engineering graduates from Chilean universities or hold an M.Sc. degree from a foreign university. Tenure is two years, the grant covering fees, books and materials. For specialization in electrical, mechanical or chemical engineering, five grants are offered in the Graduate School, for living and maintenance expenses; tenure is two years.

Universitario de Aviación, Casilla de Correo 4020, Santiago.

China

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

National Taiwan Science Hall, 41 Nan-hai Road, Taipei. Includes a planetarium and science exhibitions.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Astronautical Society of the Republic of China, 41 Nan-hai Road, Taipei.

Astronomical Society of the Republic of China, 64 Kung Yuen Road, Taipei. Aims at the promotion of the astronomical sciences and co-operation with astronomers in other countries.

UNIVERSITIES AND COLLEGES

Academia Sinica, Taipei. Includes Institutes of Mathematics and Physics.

National Taiwan University. Offers meteorology.

Colombia

NATIONAL AND STATE ACADEMIES

Academia Colombiana de Ciencias Exactas, Fisicas y Naturales [Colombian Academy of Exact, Physical and Natural Sciences], Observatorio Astronómico de Santafe de Bogota, Carrera 8a, No. 8.00, Apdo. 2584, Bogota.

FOUNDATIONS AND TRUSTS

Instituto Colombiano de Especialización Técnica en el Exterior (ICETEX) [Colombian Institute for Advanced Training Abroad], Carrera 3A, No. 18-24, Apdo. Aéreo 5735, Bogota. Offers loans and scholarships to Colombian nationals, tenable at foreign universities.

[9] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

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GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Instituto Geofísico de los Andes Colombianos [Geophysical Institute of the Colombian Andes], Apdo. Aéreo 5315, Bogota. Includes the following sections: Ionospheric Station, Model C-4, Bogota, and Meteorological Observatory, formerly Observatorio Nacional de San Bartolomé.

National Astronomical Observatory, Apdo. 2584, Bogota.

UNIVERSITIES AND COLLEGES

Pontificia Universidad Javeriana, Carrere 7A, No. 40-62, Apdo. Postal 445, Aéreo 5315, Bogota. Offers mathematics, physics, communications and control systems. The university offers two fellowships for interchange of professors and students with universities of the United States of America.

Atlantic University, Carrera 43, No. 50-53, Apdo. Aéreo 1890, Barranquilla. Offers mathematics and physics.

Cartagena University, Apdo. Postal 195, Cartagena. Offers mathematics and physics.

Del Cauca University, Papayán. Offers electronic engineering and telecommunications. Scholarships for specialized study are offered to nationals of Latin American countries (one per country), who have completed two years' study of engineering and are well qualified to pursue a course in electronics and telecommunications. Tenure is three years, at $1,100 per year.

National University of Colombia, Ciudad Universitaria, Bogota. Offers mathematics, physics and engineering. An astronomical observatory is affiliated to the university.

Universidad Tecnológica de Pereira [Pereira Institute of Technology], Carrera 13, No. 18-56, Apdo. Aéreo 97, Pereira. Offers physics and mathematics.

Del Valle University, Apdo. Aéreo 2188, Cali. Includes Division of Engineering. Exchange scholarships are offered to students of the University of Oakland, United States of America.

The universities of Colombia exchange studentships (10) with the University of California, United States of America, allow North American students to participate in a seminar organized by the National University of Colombia, for one month minimum.

The Ministry for External Relations, Bogota, offers exchange scholarships in a wide range of fields of study to nationals of Argentina, Bolivia, Brazil, Costa Rica, Ecuador, the Federal Republic of Germany, France, Guatemala, Haiti, Honduras, Italy, Mexico, Nicaragua, Panama, Peru, the Philippines, Spain, the United States of America and Venezuela.

For information on fellowships, scholarships and grants available to Colombian nationals and students in Colombian universities, see the UNESCO publication *Study Abroad*.[10]

[10] *Ibid.*

Congo (Democratic Republic of)

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Institut pour la recherche scientifique en Afrique centrale (IRSAC) [Institute for Scientific Research in Central Africa], Lwiro, D.S. Bukavu. Stations include climatology at Mabali, on Lake Tumba.

UNIVERSITIES AND COLLEGES

Meteorological Training Centre, Kinshasa. Established by the Democratic Republic of the Congo with the assistance of the United Nations Special Fund and WMO to train junior meteorologists, assistants and observers of the French-speaking countries of Africa, providing courses for these three classes of personnel for durations of twenty-seven, sixteen and twelve months respectively. The basic qualifications for entrance to junior meteorologist courses are six years' post-primary education and an additional year's specialization in mathematics and/or physics. Assistants' courses are open to observers and others who have successfully completed six years' post-primary education. Observer courses are open to those with three years' post-primary education. Preparatory courses are arranged whenever the candidates have not the required qualifications.

Université Lovanium, D.P. 127, Kinshasa XI. Has Faculties of Science and Engineering. Department of Physics offers nuclear physics and infra-red spectography. The WMO plan for training in Africa includes the establishment of a Chair of Meteorology to train senior graduate meteorologists of the French-speaking countries of Africa. However, it has so far been impossible to recruit a full-time professor or to attract university graduates to attend the course. As a provisional measure, arrangements have been made for special courses in the university to train senior meteorologist candidates who will be recruited at the third year of the Faculty of Science course. The first of these courses started in January 1966 and a qualified part-time professor was appointed by WMO to plan and assist in lecturing and supervising the course. Other qualified WMO experts in the Congo will participate in teaching.

The university offers 200 travel and study grants to nationals of African countries who have completed secondary education and have a good knowledge of English or French: maximum age is 25. Tenure is one academic year, at 70,000 Congolese francs, plus travel expenses.

Cuba

NATIONAL AND STATE ACADEMIES

Academia de Ciencias Médicas, Físicas y Naturales de la Habana [Academy of Medical, Physical and Natural Sciences], Havana.

Comisión Nacional de la Academia de Ciencias de la República de Cuba [National Commission of the Academy of Sciences], Capitolio Nacional, Havana. Scien-

tific research topics include mathematics, astronomy, meteorology and geophysics.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Instituto Nacional de Investigación Científica [National Institute for Scientific Research], Havana.

Belen College Observatory, Apdo. 221, Havana. Engages in meteorology and hurricane predictions.

Observatorio del Colegio " Nuestra Señora de Montserrat " [Our Lady of Monserrat College Observatory], San Fernando 263, Apdo. 405, Cienfuegos L.V. The meteorological station co-operates with the Belen College Observatory, Havana, and the United States Weather Bureau, Washington, D.C.

National Observatory, Casa Blanca, Havana.

UNIVERSITIES AND COLLEGES

Universidad Central de las Villas, Carretera a Camajuani, Santa Clara, L.V. Includes Faculties of Science and Technology.

Havana University, San Lázaro y L. Vedado, Havana. Faculty of Sciences includes Schools of Mathematics and Physics. Faculty of Technology includes a School of Electrical Engineering.

Oriente University, Ave. Patricio Lumumba S/N, Santiago de Cuba, Oriente. Includes Faculties of Science and Technology.

The Ministry of Education, Ciudad Libertad, Havana, offers exchange scholarships in any discipline at university level, and for advanced studies at postgraduate level, to allow foreign students to study in Cuba, and reciprocally. Tenure is for the duration of the course of studies, and the award covers travel, lodging and maintenance, with certain other allowances.

University undergraduate and postgraduate studentships in Cuba are offered to students from other countries, in particular to nationals of the countries of Asia, Africa and Latin America. Tenure and value vary according to the studies.

Czechoslovakia

NATIONAL AND STATE ACADEMIES

Czechoslovak Academy of Sciences, Národní Tr. 3, Prague 1. Publications include a " Bulletin of the Astronomical Institutes of Czechoslovakia ". The Academy promotes a programme of exploration of outer space and solar physics, especially of solar flares, photometric measurement of brightness of satellites, luminosity of twilight and night sky, study of interplanetary matter and meteorological astronomy. One fellowship in one of these fields was offered for 1966.

A Scientific Board of Astronomy, Geophysics, Geodesy and Meteorology is responsible for the following scientific institutes of the Czechoslovak Academy of Sciences and of the Slovak Academy of Sciences :

Astronomical Institutes, Prague and Bratislava ;

Institute of Geophysics, Prague ;

Institute of Physics of the Atmosphere, Prague ;

Geophysical Laboratory, Bratislava ;

Meteorological and Climatological Laboratory, Prague.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Commission for Astronautics of the Czechoslovak Academy of Sciences, Národní trída 3, Prague 1. Belongs to IAF.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Czechoslovak Scientific and Technical Society, Expert Group on Aeronautics, Gorkého nám 23, Prague 1.

Czechoslovak Mathematical and Physical Society, Prague, Malá Strana Maltézské 1. Publications include " Physics and Astronomy ".

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

A. S. Popov State Research Telecommunications Institute, Novodvorská 994, Prague 4.

Hydrometeorological Institute, Holeckova 8, Prague 5.

National Museum of Technology, Kostelní 42, Prague 7. Includes a permanent exhibition of astronomy.

Aeronautical Research and Testing Institute, Letnany 130, nr. Prague.

UNIVERSITIES AND COLLEGES

The Czechoslovak Government offers bursaries (300) to nationals of Afghanistan, Algeria, Austria, Bolivia, Brazil, Cameroon, Ceylon, Cuba, Ethiopia, France, Ghana, Guinea, India, Indonesia, Iraq, Italy, Japan, Norway, Sierra Leone, Somalia, Sudan, Sweden, Syria, Togo, Tunisia, Uganda, the United Arab Republic, the United Kingdom and the United States of America. The bursaries are for study in Czechoslovak universities; candidates will be informed by their Governments of the conditions of the awards. They should have completed advanced studies and have had three years' practical experience. Tenure is for the duration of the studies, plus six to twelve months to learn the Czech language, and the awards cover board and lodging, plus personal expenses.

The Ministry of Education and Culture offers studentships to nationals of developing countries as follows : (*a*) to those aged 17 to 30 years who have completed secondary education, duration six to seven years, 700 Kcs [11] per month, fees, travel and certain other expenses ; (*b*) to students who have completed advanced studies and have at least two years' practical experience in their fields of study, 1,100 to 1,600 Kcs, plus certain other allowances.

Bursaries are offered under the United Nations Development Programme to students from dependent territories, countries administered by Portugal, and countries of South West Africa, for university studies of profes-

[11] Koruny.

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sional training in Czechoslovakia. Tenure is four to six years, and grants cover maintenance, travel and fees.

Scholarships are offered to British postgraduate students and research workers for study and research in Czechoslovakia. Tenure is ten months, and the awards cover maintenance, lodging and personal expenses, plus certain allowances ; applications should be made to the British Council, State House, High Holborn, London W.C.1.

Exchanges for scientific and technological personnel, university staff and postgraduate students have been agreed with the British Council, 65 Davies Street, London W.1.

Basic education in subjects of general interest in the peaceful uses of outer space is given in several university institutes.

Czech Technical Institute in Prague, Horská 3, Prague 2. Faculty of Mechanical Engineering includes a Hydrothermomechanics Department at Konvitská 22, Prague 1, and a Fluid Mechanics Department. Spaceflight mechanics, trajectories and orbits are illustrated by models and teaching aids.

Comenius University of Bratislava, Safárikovo Námestie 12, Bratislava. Faculty of Natural Sciences offers meteorology.

Slovak Technical Institute, Gottwaldovo nám. 50, Bratislava. Faculty of Electrical Engineering offers radioelectronics.

Charles University, Nám Curieovych 7, Prague 1. Faculty of Mathematics and Physics offers practical astronomy and astrophysics and geophysics.

College of Mechanical and Electrical Engineering, Nejedlého sady 14, Plzen. Faculty of Mechanical Engineering includes an aerohydromechanics and thermodynamics laboratory.

Denmark

National and State academies

Academy of Technical Sciences, 11 Rigensgade, Copenhagen K. Affiliated institutions deal with geotechnics, electronics, microwaves and optics.

Royal Danish Academy of Sciences and Letters, Dantes Plads 5, Copenhagen V. Includes section of mathematics and natural sciences.

Government departments and official agencies

Danish Meteorological Institute, Gamlehavealle 22, Charlottenlund. Offers geophysical, magnetic and climatological services.

Learned societies, professional institutions and other associations

Astronomical Society, Observatoriet, Øster Voldgade 3, Copenhagen.

Danish Astronautical Society, Vagtelvej 54A, Copenhagen.

Foundations and trusts

Anglo-Danish Society, 5 St. Helen's Place, London E.C.3. Offers scholarships to graduates or advanced students from the United Kingdom to study at Aarhus University or Copenhagen University. Tenure is six to eight months, at £40 per month plus travel grant.

Carlsberg Foundation, H.C. Andersens Boulevard 35, Copenhagen V. General department promotes studies in natural sciences and mathematics.

International Research Foundation of Denmark, Frederiksholms Kanal 21, Copenhagen K. Offers grants for research workers from other countries, sponsored by Danish nationals engaged in research, for study in Denmark. Value is 18,000 to 24,000 kroner.

Government or official research establishments

Institute of Aviation Medicine, Tagensvej 18, Copenhagen N.

Space Research Observatory, Rude Skov, Birkeröd. Offers satellite observation and telemetry.

Ole Rømer Observatory of Aarhus University, Aarhus C. Offers courses in photographic and photoelectric stellar photometry, meteors, theoretical astrophysics and celestial mechanics.

University Astronomical Observatory, Øster Voldgade 3, Copenhagen K. A new university observatory has been established at Brorfelde, Tølløse.

Industrial or commercial research organizations

Danspace, Lundtoftevej 7-9, Lyngby ; an association of companies and scientific institutions representing Denmark on EUROSPACE.

Universities and colleges

Danish government scholarships are awarded by the Ministry of Education, Frederiksholms Kanal 21, Copenhagen K, for undergraduate or postgraduate studies in Denmark, to nationals of Austria, Belgium, Czechoslovakia, the Federal Republic of Germany, Finland, France, Iceland, Israel, Italy, Japan, the Netherlands, Norway, Poland, Spain, Sweden, Switzerland, Turkey, the USSR, the United Kingdom, the United States of America and Yugoslavia. Tenure is eight months and value 6,240 kroner, plus tuition and travel grant.

Unilateral Danish government grants are available to educational staff, undergraduates and graduates from overseas countries not participating in an exchange fellowship programme with Denmark. Tenure is eight months and value 6,240 kroner plus up to 1,200 kroner towards travel expenses.

Postgraduate research scholarships are offered to graduate nationals of Belgium, Czechoslovakia, Italy, Poland, the USSR and the United States of America who have specific research programmes. Award is one or more monthly payments of 1,200 kroner.

Postgraduate exchange grants are offered to nationals of Czechoslovakia, Poland and the USSR.

Danish government scholarships are offered to nationals of Iceland for study in Denmark.

For information on study grants and fellowships available to Danish nationals for study in other countries, see the UNESCO publication, *Study Abroad*.[12]

Aarhus University, Aarhus. Faculty of Natural Sciences offers mathematics, physics and astronomy. A Danish government scholarship is open to a Scandinavian student for study at Aarhus University, for one year at 18,060 kroner.

Technical University of Denmark, Øster Voldgade 10, Copenhagen K. Offers mathematics, physics, electronics, telecommunications and servomechanisms.

Copenhagen University, Frue Plads, Copenhagen K. Faculty of Mathematics and Natural Sciences offers mathematics, physics, geophysics, meteorology and astronomy.

Exchange scholarships are offered by the Danish Government to graduates or undergraduates of the Federal Republic of Germany, for study at Copenhagen University. Duration is three months (summer term).

Ecuador

Government departments and official agencies

Servicio Nacional de Meteorología e Hidrología [National Meteorological and Hydrological Service], Avenida Colón No. 1663, Quito.

Government or official research establishments

Satellite Tracking Station, Embassy of the United States of America, Quito.

Instituto de Energiá Nuclear y Aprovechamiento de la Energía Solar [Institute of Nuclear Energy and Utilization of Solar Energy]. Affiliated to Guayaquil University.

Quito Astronomical Observatory, Apdo. 165, Quito. Associated with the Escuela Politécnica Nacional. Concerned with astronomy, seismology and meteorology. Offers programmes in positional astronomy for latitude and longitude determination and improvement of the fundamental star catalogue.

Universities and colleges

Escuela Politécnica Nacional [National Polytechnic School], Apdo. 165, Quito. Offers astronomy, seismology and meteorology in association with the Quito Astronomical Observatory.

Escuela Superior Politécnica del Litoral [Polytechnic College of the Litoral], Casilla 5863, Guayaquil. Offers mathematics and physics.

Central University of Ecuador, Garcia Moreno 887, Y. Espejo 945, Casilla 166, Quito. Includes Faculty of Physical and Mathematical Sciences. Studentships are available in certain cases to nationals of any country who satisfy the entry conditions of the university courses. Tenure is one academic year, and awards cover matriculation fees.

Cuenca University (also known as Universidad del Azuay), Apdo. 168, Cuenca. Faculty of Mathematical and Physical Sciences offers astronomy. Studentships are available to nationals of any country who satisfy the entrance conditions for the university courses. Tenure is one academic year, covering matriculation fees.

University of Guayaquil, Calle Chile 900, P.O. Box 471, Guayaquil. Includes Faculty of Mathematical and Physical Sciences.

National University of Loja, Apdo. 54, Loja. Faculty of Science offers mathematics, physics and meteorology.

Manabi Technical University, Casilla 82, Portoviejo, Manabí. Includes Faculty of Mathematics, Physics and Chemistry.

Under the Inter-American Convention for the Advancement of Cultural Exchange, two scholarships are offered to graduate nationals of the United States of America, covering maintenance and matriculation expenses. Applications should be made to the Institute of International Education (see United States of America entry). For fellowships and study grants available to nationals of Ecuador, see the UNESCO publication, *Study Abroad*.[13]

Ethiopia

Government or official research establishments

Geophysical Observatory, P.O. Box 399, Addis Ababa. This geophysics research department of the Faculty of Science of the Haile Selassie I University was opened during the International Geophysical Year as the scientific contribution of Ethiopia to that international effort. The research programme includes seismology; geomagnetism with special emphasis on the equatorial electro-jet, its normal daily variation, micropulsations, etc.; gravimetry in relation to the geotectonics of the R.W. system; cosmic noise; Faraday rotation effects and meteorology.

Smithsonian Satellite Tracking Observatory, Debre Zeit, near Addis Ababa. Opened in July 1966 for optical tracking with a Baker-Nunn camera.

Universities and colleges

Haile Selassie I University, P.O. Box 1176, Addis Ababa. Includes Faculties of Science and Engineering.

Federal Republic of Germany

National and State academies

Göttingen Academy of Sciences, Prinzenstrasse 1, Göttingen. Includes sections of mathematics and physics.

[12] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[13] *Ibid.*

Academy of Sciences and Literature, Geschwister Schollstrasse 2, Mainz. Includes sections of mathematics and natural sciences.

Bavarian Academy of Sciences, Marstallplatz, Munich. Includes sections of mathematics and natural sciences.

Heidelberg Academy of Sciences, Karlstrasse 4, Heidelberg. Includes sections of mathematics and natural sciences.

Government departments and official agencies

Federal Ministry for Scientific Research, Luisenstrasse 46, Bad Godesberg. Includes Department of Space Research and Technology, covering basic legal and administrative matters, space information, over-all planning and development of research, economic and financial aspects, treaties and defence, participation in ELDO and ESRO, research physics of near and remote space, bioastronautics, satellite research, spaceflight research and technology, space vehicles and systems, guidance and control equipment, measurement, data recording and telemetry, energy and propulsion, ground stations, test facilities and satellite tracking.

German Commission for Space Research, administered by the Federal Ministry for Scientific Research, Luisenstrasse 46, 532 Bad Godesberg. Includes specialist groups for space data, spaceflight research and technology, electronics and communication, legal and administrative questions, economic and financial questions.

Society for Space Research, Kölner Strasse 171, 532 Bad Godesberg. The society has certain responsibilities in promoting space research and technology, especially in the programmes of ESRO and ELDO. It is administered by the Federal Ministry for Scientific Research.

Learned societies, professional institutions and other associations

Astronomical Society, Hamburger Sternwarte, Hamburg-Bergedorf.

Berlin Mathematical Society, Hardenbergstrasse 34, 1 Berlin 12.

German Research Association, Kennedyallee 40, Bad Godesberg. Provides financial and other assistance for research ; membership includes the academies of sciences, all universities and many scientific research establishments.

German Geophysical Society, von Melle-Park 6, Hamburg 13.

German Society for Flight Sciences (DGF), Berliner Freiheit 16, 53 Bonn. Co-ordinates the research activities of the associated research stations AVA, DFL and DVL ; other members include WGLR and DGRR.

German Society for Research, Frankengraben 40, Bad Godesberg.

German Society for Aviation and Space Medicine, Robert-Koch-Strasse 8a, 355 Marburg/Lahn.

German Rocket Technology and Space Travel Society (DGRR), Am Glockenbach 12, 8 Munich 5. Concerned with the promotion of technological and scientific work in all aspects of rocket technology and space research. Belongs to IAF.

German Mathematical Association, Mathematisches Seminar der Universität, Olshausenstrasse, Kiel.

German Meteorological Society, Frankfurterstrasse 135, Offenbach a. M.

German Physics Society, Heraeustrasse 12-14, 645 Hanau.

German Rocket and Space Flight Museum, Memmingerstrasse 7, Stuttgart, Bad Connstatt. Belongs to IAF.

Specialist Technical Group for Aviation and Space Flight, Prinz-Georg-Strasse 77-79, 4 Düsseldorf.

Society for Applied Mathematics and Mechanics, Templergraben 55, 51 Aachen.

Hermann Oberth Society for the Furtherance of Space Investigation and Development, Fritz-Beindorff-Allee 9, Hanover. Belongs to IAF.

Fraunhofer Society Institute for the Chemistry of Propellants and Explosives, Rappenbergstrasse, 7501 Berghausen/Bd.

Mathematical Research Institute, Lorenzhof, Oberwolfach-Walke, Schwarzwald.

Hamburg Meteorological Society, Bernhard-Nocht-Strasse 76, Hamburg 4.

Telecommunication Society, Stresemann Allee 21, Frankfurt a. M., S.10.

Association of German Meteorological Societies, Amalienstrasse 52 III, 8 Munich 13.

Scientific Society for Aviation and Space Flight (WGLR), Martinstrasse 40-42, 5 Cologne. Belongs to IAF. Specialized committees include the following :

Fluidmechanics and thermodynamics : aerodynamics, with sub-committees for aerodynamic measurements and plasmadynamics ;

Propulsion and energy sources : energy conversion and electric propulsion, rocket technology, flight propulsion, fuel and nuclear propulsion ;

Structures and construction : structural strength and aeroelasticity, construction ;

Aerospace biophysics : aviation and spaceflight medicine ;

Aviation law and space law.

Foundations and trusts

Humboldt Foundation. Schillerstrasse 12, 532 Bad Godesberg. Provides 300 research fellowships annually for post-doctoral scholars and scientists from all countries for advanced research at universities and research institutions in the Federal Republic of Germany. Candidates must have two years' academic experience in teaching and research. Tenure is ten months, at 8,000 DM[14] plus travel, fees and certain allowances. The foundation also offers 50 fellowships to candidates

[14] Deutsche [German] marks.

with at least five years' academic experience in teaching or independent research and with publications of high scholastic merit to their credit. Tenure is six or twelve months, at 6,600 to 13,200 DM plus travel, fees and certain allowances.

German Ibero-American Foundation, Alsterglacis 8, 2 Hamburg 36. Offers scholarships, travel grants and research fellowships to graduate students from Latin American countries for study in the Federal Republic of Germany.

Friedrich Ebert Foundation, Koblenzer Strasse 54, 53 Bonn. Offers 20 scholarships to nationals of African, Asian and Latin American countries, age over 21 years, for study in the Federal Republic of Germany. Tenure varies according to the course of study, at 300 DM per month, plus tuition and other allowances.

Fritz Thyssen Foundation, Habsburger Ring 9, Cologne 10 (for the promotion of scientific research).

Foreign Students' Catholic Service, Reuterstrasse 39, 53 Bonn. Offers scholarships for study in any field in the Federal Republic of Germany to nationals of Asian, African and Latin American countries without facilities for postgraduate studies. Applicants should be graduates (in certain cases, undergraduates) of at least 20 years of age. Tenure is one year (renewable) at 320 DM per month, plus partial fees and books.

King Edward VII British-German Foundation, 64 Denison House, 296 Vauxhall Bridge Road, London, S.W.1. Offers three scholarships to graduates of British universities for study in the Federal Republic of Germany, tenable for ten months at 450 DM per month, plus tuition and travelling expenses.

Ludwig Missionary Association, Hirtenstrasse 26, 8 Munich 3. Offers scholarships to nationals of African and Asian countries for study at university level in the Federal Republic of Germany. Candidates should be graduates aged 20 to 30. On completion of study, recipients must return to their home countries. Tenure is one year, renewable, at 350 DM per month, plus tuition.

Maximilianeum Foundation, Max-Planck-Strasse 1, 8 Munich 30. Offers exchange scholarships to male students or graduates of University of Paris, France; University of Pavia, Collegio Ghislieri, Italy; University of Salamanca, Spain, and Brasenose College, Oxford, England. Awards are for one academic year, covering all expenses.

Mitbestimmung Foundation, Breite Strasse 13, 4 Düsseldorf. Ten scholarships are offered by the German Federation of Trade Unions to nationals of developing countries for university study in the Federal Republic of Germany. Tenure is one year (renewable) and awards cover maintenance, tuition, travel and books.

Volkswagen Foundation, Schützenallee 9, 3000 Hanover-Döhren. Promotes research into science, the humanities and technology.

Federation of German-American Clubs, Richard-Wagnerstrasse 14, 7 Stuttgart 0. Offers 20 scholarships to nationals of the United States of America for study in the Federal Republic of Germany, and *vice versa*. Candidates must be under 25, have completed two semesters of university study, and have outstanding scholastic and personal qualities. Tenure is ten months, at 3,500 DM.

German National Union of Students, Georgstrasse 25, 53 Bonn. Offers scholarships to refugee students from overseas who are of university entrance standard and to students from former colonial territories at 400 DM per month.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Astronomical Institute and Stellar Observatory, Würzburg University, Würzburg.

Astronomical Institute of Bonn University, Poppelsdorfer Allee 49, Bonn. Includes Institute of Astrophysics and Extraterrestrial Research, Hoher List observatory and Stockert radio-telescope.

University Astronomical Institute, Senckenberg-Anlage 23, Frankfurt a. M.

University Astronomical Institute, Steinfurterstrasse 107, Münster.

University Astronomical Institute, Waldhäuserstrasse 64, Tübingen, and Weissenau bei Ravensburg.

German Aerospace Research Establishment (DFL), Flughafen, 33 Braunschweig. Includes Institutes of Aerodynamics, Mechanics of Flight and Jet Propulsion.

German Experimental Establishment for Aviation and Space Flight (DVL), Linder Höhe, 505 Porz-Wahn, and Flughafen, Mülheim-Ruhr. The establishment includes the following:

Applied Gasdynamics Institute, Linder Höhe, 505 Porz-Wahn;

Applied Mathematics and Mechanics Institute, Hebelstrasse 27, 78 Freiburg (Breisgau);

Chemical Rocket Propulsion Institute, Hurthäuser Wald, 7101 Lampoldshausen (Württ.);

Energy Conversion and Electric Propulsion Institute, Allmandstrasse 124, 7 Stuttgart-Vaihingen;

Radio and Microwave Institute, Oberpfaffenhofen Post 8031, Wessling-Oberbay;

Aerospace Medical Institute, Kölnerstrasse 70, 532 Bad Godesberg;

Jet Propulsion Institute, Linder Höhe, 505 Porz-Wahn;

Atmospheric Physics Institute, Flughafen Riem, 8 Munich 64;

Plasmadynamics Institute, Allmandstrasse 124, 7 Stuttgart-Vaihingen;

Rocket Propellants Institute, Allmandstrasse 124, 7 Stuttgart-Vaihingen;

Space Simulation Institute, Linder Höhe, 505 Porz-Wahn;

Guidance and Control Technology Institute, Wessling-Oberbay, Oberpfaffenhofen Post 8031;

Theoretical Gasdynamics Institute, Theaterstrasse 13, 51 Aachen;

Turbulence Research Institute, Gartenufer 8, 1 Berlin 12;

Nuclear Research Society, Weberstrasse 5, Karlsruhe;

Hamburg Stellar Observatory, Gojenbergsweg 112, Hamburg-Bergedorf; activities include astronomy, photometry and spectroscopy;

Institute of Spectrochemistry and Applied Spectroscopy, Bunsen-Kirchhoffstrasse, Dortmund;

Institute of Radiation and Nuclear Physics, Nussallee 14-16, Bonn;

Kiel University Institute of Theoretical Physics and Stellar Observatory, Neue Universität, Haus C 4/I, Olshausenstrasse, Kiel; astrophysics research; National Stellar Observatory, Königstuhl, Heidelberg;

Max Planck Society for the Promotion of Science, Bunsenstrasse 10, Göttingen; this society includes the following research bodies:

- Göttingen Experimental Aerodynamics Establishment of the Max Planck Society for the Promotion of Science, Bunsenstrasse 10, Göttingen; includes Department of Aerodynamics, Gasdynamics, Spacecraft Dynamics;
- Max Planck Institute for Aeronomy, Lindau-über-Northeim, Hanover;
- Institute for Stratospheric Physics, 3411 Lindau-über-Northeim, Hanover;
- Institute for Ionospheric Physics;
- Max Planck Institute for Nuclear Physics, Saupfercheckweg, Heidelberg;
- Max Planck Institute for Physics and Astrophysics, Föhringer Ring 6, Munich 23; Institute of Physics, Institute of Astrophysics and Institute of Extraterrestrial Physics, 8046 Garching near Munich;
- Research Establishment for Spectroscopy in the Max Planck Society, Bunsenstrasse 10, Göttingen;
- Max Planck Institute for Aerodynamics, Böttingerstrasse 6-8, Göttingen;
- Institute of Plasma physics, Promenadeplatz 9 II, 8000 Munich 2.

State Physics Institute, Hamburg University, Jungiusstrasse 9, Hamburg 36.

Computation Centre of the Institute of Applied Mathematics, University of Freiburg im Breisgau, Hebelstrasse 40, Freiburg im Breisgau.

Remeis Observatory, Sternwartstrasse 7, Bamberg; astronomical institute of the Erlangen-Nuremberg University.

Bochum Observatory and Institute of Satellite and Space Research, Blankensteinerstrasse 200a, Bochum; planetarium and radio-telescope for ultra-short wave radiation.

University Observatory, Geismarlandstrasse 11, Göttingen; research in solar physics and stellar photometry.

University Observatory, Sternwartstrasse 23, Munich 27.

Industrial or commercial research organizations

Study Group on Satellite Tracking Systems, Boelkow G.m.b.H., Ottobrun near Munich.

Federal Association of the German Aerospace Industry (BDLI), Heerstrasse 90, 532 Bad Godesberg.

Federal Association of the Aero-accessories and Rocket Industry, Stiftstrasse 31, 2 Hamburg 1.

International Atomic Reactor Company (Interatom), Postfach, 506 Bensberg-bei-Köln. Space activities include the development of nuclear reactors for on-board power supplies for spacecraft, development of electric propulsion systems for satellite stabilization and spacecraft propulsion.

Commission for Space Technology of the Federal Association of the German Aerospace Industry and the German Society for Flight Sciences, Berliner Freiheit 16, 53 Bonn.

Universities and colleges

German Academic Exchange Service, Kennedyallee 50, 532 Bad Godesberg, offers scholarships to nationals of all countries for study at German institutions of higher education. Candidates should have completed two years of university level study: age 18 to 30 years, with a good knowledge of German. Tenure is usually one academic year, at 400 DM per month, plus tuition and certain other expenses.

Dankstipendien (75) are available to students from the United States of America for study in the Federal Republic of Germany, age 20 to 30 years. Tenure is twelve months at 400 DM per month, plus tuition and travel expenses.

Bavarian Ministry of Education and Culture, Salvatorplatz 2, 8 Munich 1, offers scholarships for study in Bavaria to university students and graduates from all countries on a reciprocal basis, and to students from the United States of America. Tenure is one year, at 3,000 DM.

North-Rhine-Westphalian Ministry of Education, Karltor 7, 4 Düsseldorf, offers three scholarships, tenable at Münster University for one year at 350 DM per month, to British graduates, preferably with research experience.

For information on awards available to nationals of the Federal Republic of Germany, and to graduates of German universities, see the UNESCO publication, *Study Abroad.*[15]

Free University of Berlin, Ihnestrasse 24, Berlin-Dahlem. Faculty of Mathematical and Natural Sciences offers mathematics, physics and meteorology. Exchange scholarships (22) are offered to nationals of Denmark, France, Greece, Spain, the United Kingdom, the United States of America and Yugoslavia, studying at universities offering reciprocal facilities. Age over 18 years. Awards are for studies in fields including medicine, law and natural sciences. Tenure is for ten months, at 400 DM per month plus tuition and some travel.

Ruhr University, 463 Bochum-Querenburg, Bochum. Includes Departments of Mechanical and Civil Engineering (offering aerodynamics), Mathematics, Physics, Geosciences and Astronomy.

[15] UNESCO, *Study Abroad, 1966-1968,* Paris, 1966

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Friedrich-Wilhelms University of the Rhineland, Liebfrauenweg 3, Bonn. Faculty of Mathematics and Natural Sciences offers physics, mathematics, astronomy, radio-astronomy, atomic physics, nuclear physics and meteorology. Scholarships (60) are open to students from all countries who have completed at least three semesters at a recognized university ; age 20 to 35 years, preferably students from universities giving reciprocal arrangements. Tenure is one or two semesters, at 350 DM per month, plus tuition fees.

Johann Wolfgang Goethe University, Mertonstrasse 17, 6 Frankfurt am Main. Faculty of Natural Sciences offers mathematics, physics, nuclear physics, geophysics and meteorology. Exchange scholarships are available to nationals of all countries who are students of universities offering reciprocal arrangements ; age 22 years minimum. Tenure is one academic year (renewable) at 350 DM per month.

Georg-August University of Göttingen, Wilhemsplatz 1, Göttingen. Faculty of Mathematics and Natural Sciences offers mathematics, physics, astronomy and astrophysics. There is a Geophysical Institute (Herzberger Landstrasse 180, Göttingen). Scholarships (10) are offered to students from all countries for study at Göttingen University. Candidates must have completed at least two terms at Göttingen University. Tenure is six to twelve months, at 250 to 300 DM per month, plus tuition. An additional exchange scholarship is offered to a student from Caen University, France, for one academic year, at 400 DM.

Hamburg University, Edmund-Siemens-Allee 1, Hamburg 13. Faculty of Mathematical and Natural Sciences offers mathematics, physics, geophysics, meteorology, astronomy and astrophysics.

Ruprecht-Karl University, Grabengasse 1, Heidelberg. Faculty of Natural Sciences offers mathematics, physics, nuclear physics and astronomy. A scholarship is offered to a member of a British university, preferably a third year undergraduate, for one year at 400 DM per month, plus fees.

Christian-Albrecht University, Neue Universität, Olshausenstrasse 40, Kiel. Faculty of Mathematics and Science offers mathematics, physics and geophysics. City of Kiel scholarships (5) are offered to nationals of Denmark, Finland, Iceland, Norway and Sweden, minimum age 20, who have completed at least three semesters of university study. Tenure is one academic year at 300 DM per month. Tuition scholarships (20) for one term (renewable) are open to students from all countries. Exchange studentships are available to students at Helsinki University, Finland ; Rennes University, France ; Bologna University, Italy ; Aberdeen and Hull Universities, United Kingdom ; and Arkansas, Indiana and Kansas Universities, United States of America. Tenure is five to ten months, at 350 to 400 DM per month, plus tuition.

Cologne University, Albertus-Magnus-Platz, Köln-Lindenthal. Faculty of Mathematics and Natural Siences offers mathematics, physics, nuclear physics and meteorology. The Institute of Aerospace Law forms part of the Law Faculty. Scholarships are available to a graduate or undergraduate student from the United Kingdom and a student from the United States of America. Tenure is one academic year at 350 DM per month, plus tuition. Exchange studentships are offered reciprocally to students from the Catholic University of Louvain, Belgium ; the University of Clermont-Ferrand, France ; the University of Genoa, Italy ; Sophia University in Tokyo, Japan ; the Catholic University of Nijmegen, Netherlands ; the Universities of Madrid and Salamanca, Spain. Tenure is one academic year, at 350 DM per month, plus tuition.

Johannes Gutenberg University, Saarstrasse 21, Mainz. Faculty of Natural Sciences offers mathematics, physics, chemistry, nuclear physics and meteorology. Scholarships offered by the State Government of the Rhineland Palatinate to nationals of all countries are tenable in this faculty. Candidates should be graduates and preferably postgraduate students, minimum age 21. Tenure is one academic year, at 400 DM per month, plus tuition.

Ludwig-Maximilian University, Geschwister Scholl-platz 1, Munich. Faculty of Natural Sciences offers mathematics, physics, geophysics, meteorology and astronomy.

Wilhelm University of Westphalia, Schlossplatz 2, Münster. Faculty of Mathematics and Natural Sciences offers mathematics, physics, geophysics, nuclear physics and astronomy. Exchange studentships, providing maintenance and tuition for up to one year, are available reciprocally to nationals of all countries.

Julius-Maximilian University, Sanderring 2, Würzburg. Faculty of Natural Sciences offers mathematics, physics and astronomy.

Albert-Ludwig University, Belfortstrasse 11, Freiburg i. Br. Faculty of Natural and Mathematical Sciences offers physics and mathematics. Includes German Aerospace Experimental Establishment.

Exchange studentships are available to students of Grenoble University, France ; Scuola normale superiore, Pisa, Italy ; and Glasgow University, Scotland (United Kingdom). Tenure is one academic year, or five months for Glasgow University students, at 400 DM per month, plus tuition.

Rhine-Westphalia Institute of Technology, Templergraben 55, Aachen. Offers mathematics, physics, geodesy, aerodynamics, space vehicle dynamics, electronics and telecommunications.

Technological University, Hardenbergstrasse 34, Berlin-Charlottenburg 12. Offers mathematics, physics, nuclear physics, geodesy, astronomy, aerodynamics, high-frequency techniques and telecommunications. An exchange studentship, which may be in engineering, is available to nationals of UNESCO member States, preferably graduates. A knowledge of German is essential. Tenure is nine months, at 400 DM per month, plus tuition.

Carolo Wilhelmina Institute of Technology, Pockelsstrasse 14, 33 Braunschweig (Brunswick). Offers mathematics, physics, geophysics, meteorology, aviation, aero-elasticity, nuclear technology and high-frequency techniques.

Darmstadt Institute of Technology, Hochschulestrasse 1, 61 Darmstadt. Offers mathematics, physics, telecommunications, electronics, atomic physics and meteorology. Scholarships (2) are offered to graduate or undergraduate members of British universities for study in fields including engineering, chemistry, physics and mathematics. Tenure is ten months, at 400 DM per month.

Hanover Institute of Technology, Welfengarten 1, Hanover. Offers mathematics, physics, electronics and telecommunications.

Baden Institute of Technology, Kaiserstrasse 12, Karlsruhe, offers mathematics, physics, nuclear physics, geophysics, meteorology, aerodynamics, thermodynamics, electronics, high frequency techniques and telecommunications. Scholarships in fields including engineering and chemistry are available to nationals of Finland, France and Sweden with a knowledge of German. Candidates must possess a good academic record and professional qualifications, and have completed at least four terms of higher studies. Tenure is ten months, at 400 DM per month, plus tuition.

Munich Institute of Technology, Arcisstrasse 21, Munich 2. Offers mathematics, physics, mechanics, electronics, high-frequency techniques, telecommunications, flight and space mechanics.

Stuttgart Institute of Technology, Huberstrasse 16, Stuttgart-Nord. Offers mathematics, physics, thermodynamics, electronics, nuclear engineering, statics and dynamics of aerospace structures. Exchange studentships (3) in technical subjects are available to students of Manchester College of Technology, England, and Georgia Institute of Technology, Atlanta, and the University of Kansas, Lawrence, in the United States of America. Candidates must possess good academic records and be recommended by their universities. Tenure is ten months at 400 DM per month, plus tuition.

Finland

National and State academies

Finnish Academy of Science and Letters, Helsinki, Snellmaninkatu 9. Includes mathematics and natural sciences section.

Academy of Finland, Helsinki, Hallituskatu 1. Subjects include technical physics, mathematics, meteorology and chemistry.

Academy of Technical Sciences, Lönnrotinkatu 37, Helsinki.

Government departments and official agencies

Finnish Meteorological Office, Helsinki 10, Vuorikatu 24, Box 10503. Studies include earth magnetism.

Learned societies, professional institutions and other associations

Finnish Scientific Society, Helsinki, Tammitie 11. Includes mathematics and physics section.

The Engineering Society in Finland, Georgsgatan 30, Helsinki.

Foundations and trusts

Central Committee of Swedish-speaking Scientists and Scholars in Finland, Kasarminkatu 40, Helsinki. Offers approximately 20 research grants to young Swedish-speaking scientists and scholars in Finland, tenable in any country, for one year, at approximately 2,500 markka.

Finnish Foundation of Technology, Aleksanterinkatu 3, Helsinki. Offers approximately 50 scholarships annually for the advancement of engineering and technology to Finnish nationals for study in Finland and abroad, and to nationals of any other country for study in Finland. Tenure is one year maximum for Finnish students and up to five years for foreign students, with a maximum of 10,000 markka.

Universities and colleges

Swedish University of Åbo, Åbo, Domkyrkotorget. Faculties include Mathematics and Natural Science and Chemical Technology. Exchange scholarships are available to students of Norrland Nation, Uppsala, Sweden, in exchange for similar awards offered to students of Österbottniska Nationen.

University of Helsinki, Helsinki. Offers mathematics, physics, chemistry, nuclear physics, meteorology and astronomy.

Institute of Technology, Otaniomi, Helsinki. Offers mathematics, physics, nuclear physics, aeronautics, electrical engineering, electronics, thermodynamics and radio-communications.

Turku University, Turku. Faculty of Mathematics and Natural Sciences offers mathematics, physics and astronomy.

The Finnish Commission for International Fellowships, Korkeavuorenkatu 21, Helsinki, administers the Finnish government fellowship programme and publishes the brochure " Finnish government fellowships available to foreign students and scholars for studies and research in Finland ".

Finnish government fellowships (20) for advanced study in Finland are made on an exchange basis to nationals of Austria, Bulgaria, Czechoslovakia, the Federal Republic of Germany, Iceland, Italy, Norway, Poland, Sweden, the USSR, the United Kingdom and Yugoslavia. Candidates must have either Finnish language or Swedish, English, French or German. Tenure is for eight months at 550 markka per month for post-graduates and 450 markka for undergraduates. A similar scheme, but for four months' tenure, operates for Belgium, the Democratic Republic of Germany, Greece, Ireland and Switzerland.

Finnish government fellowships of two to eight months are available to nationals of all countries, and of twelve months to students from African countries. The value is 550 markka per month.

For particulars of fellowships and study grants available to Finnish nationals and students at Finnish institutions for study in other countries, see the UNESCO publication, *Study Abroad.* [16]

France

National and State academies

Institut de France [French Institute], 23 quai de Conti, Paris 6e. Includes the Académie des sciences [Academy of Sciences], with sections of mathematics, mechanics, astronomy, geography and navigation, physics and chemistry.

Government departments and official agencies

Centre administratif de la météorologie nationale [Administrative Centre for National Meteorology], 196 rue de l'Université, Paris 7e.

Centre national d'études spatiales (CNES) [National Space Study Centre], 129 rue de l'Université, Paris 7e. The centre is a financially autonomous public body, under the Minister of State responsible for scientific research and atomic and space matters. It prepares national programmes of space research, arranges for their implementation in laboratories or technical establishments of the centre or in conjunction with other organizations, and promotes international co-operation. Includes a Scientific and Technical Directorate; divisions of International Affairs, University Relations, Satellite, Ground Equipment and Sounding Rockets; space centres at Brétigny-sur-Orge (Seine-et-Oise), Toulouse and in Guiana; and a balloon launching centre at Aire-sur-l'Adour.

CNES activities include international co-operation in space programmes, the collection of information and the publication of scientific and technical works. Educational activities are directed by a Permanent Commission on Space Education. To train scientific and technical research staff and orient them towards such fields as astronomy, geophysics, space electronics or rocket propulsion, CNES awards bursaries for practical studies or postgraduate courses, and organizes study conferences for exchanges of views among specialists.

The national research programme includes astronomy studies in the ultra-violet and infra-red régimes, terrestrial environment studies and sun-earth relations, and the development of a meteorological system based on the use of balloons monitored by satellite. France has launched its own satellites and has established networks of ground telemetry stations; the launching base at Hammaguir in the Sahara, near Colomb-Béchar, is being replaced by the Guiana space centre.

Centre national d'études des télécommunications (CNET) [National Study Centre for Telecommunications], 38-40 rue du Général Leclerc, Issy-les-Moulineaux, Seine, (92). Includes a Space Radio-electronics Research Department and an experimental antenna laboratory at La Turbie, Alpes-Maritimes, for high-frequency radio-electric wave guidance in the exosphere. Engages in study of ionization irregularities and wind profiles in the lower regions of the ionosphere. The space telecommunications station at Pleumeur-Bodou, Côtes-du-Nord, receives transmissions from the American meteorological satellites. The centre comes under the Ministry of Posts and Telecommunications.

Centre national de la recherche scientifique (CNRS) [National Scientific Research Centre], 15 quai Anatole France, Paris 7e. This government organization, under the Ministry of National Education, advises on research facilities and allocation of funds. It is engaged in the co-ordination and advancement of scientific research, the provision of research grants to individuals or scientific groups and the establishment or subsidizing of research laboratories.

The CNRS Research Centre, 1 place Aristide Briand, Bellevue, Seine-et-Oise, includes:

Laboratoire de physique de la basse atmosphère [Low Atmosphere Physics Laboratory];

Laboratoire des rayons X [X-ray Laboratory];

Service d'aéronomie [Aeronomy Service], réduit de Verrières-le-Buisson, Seine-et-Oise, (91);

Laboratoire de physique cosmique [Cosmic Physics Laboratory], réduit de Verrières-le-Buisson, Seine-et-Oise, (91); participates in the international programme of the Solar Particles and Radiations Monitoring Organization;

Laboratoire des basses températures [Low Temperature Laboratory];

Laboratoire d'aérothermique [Aerothermic Laboratory], 4ter route des Gardes, Meudon, Seine-et-Oise, (92);

Laboratoire de physique de froid et service d'essais [Cryogenic Physics Laboratory and Test Service], 4ter route des Gardes, Meudon, Seine-et-Oise;

Laboratoire de magnétisme et de physique du solide [Magnetism and Solid State Physics Laboratory].

The CNRS Nuclear Research Centre, rue du Loess, Strasbourg-Cronenbourg, Bas-Rhin, includes:

Département de recherches nucléaires [Nuclear Research Department];

Département de physique corpusculaire [Corpuscular Physics Department];

Département de physique nucléaire théorique [Department of Theoretical Nuclear Physics];

Département de chimie nucléaire [Department of Nuclear Chemistry];

Département des applications biologiques [Department of Biological Applications].

Other CNRS establishments include:

Institut d'astrophysique [Astrophysics Institute], 98 boulevard Arago, Paris 14e, the theoretical astrophysics section of which is amalgamated with the Astrophysics Laboratory of the Faculty of Science of Paris University.

Groupe de recherches ionosphérique (GRI) [Ionospheric Research Group], Observatoire de Parc St. Maur, 4 avenue de Neptune, St. Maur-des-Fossés (94).

[16] UNESCO, *Study Abroad, 1966-1968,* Paris, 1966.

Research fellowships, under reciprocal agreements, are offered to nationals of the following countries for six to ten months, for research in France: Belgium, Spain, Hungary, Israel, Italy, Japan, Netherlands, Poland, Romania, United Kingdom, Czechoslovakia and the USSR. Expenses in France are covered by grants from CNRS, travel expenses being paid by the fellow's country. Application must be made to the recognized agency in the applicant's country of origin.

Délégation générale à la recherche scientifique et technique (DGRST) [General Delegation on Scientific and Technological Research], 103 rue de l'Université, Paris 7e. This is a government advisory committee, under the Minister of State responsible for scientific research and atomic and space matters.

Conseil de l'espace [Space Council]. This is the official advisory council on space matters.

Direction de la météorologie nationale [National Meteorological Directorate], 1 quai Branly, Paris 7e. Forms a part of the Ministry of Supply; includes Institute for Meteorological Studies and Research and School of Meteorology.

Direction des recherches et des moyens d'essais (DRME), Ministère des Armées [Directorate of Research and Test Facilities of the Ministry for the Armies], 5bis avenue de la Porte de Sèvres, Paris 15e. The Director of Technical Research supervises ONERA. The Director of Test Facilities supervises the Centre interarmées d'essais d'engins spéciaux [Inter-army Test Centre for Special Devices] at Colomb-Béchar, Algeria, the Landes Test Centre and the Centre d'essais et de recherches d'engins spatiaux (CERES) [Test and Research Centre for Space Propulsion]. The Director of Scientific Research ensures liaison with the National Centre for Telecommunications Studies and the universities.

CNES is under the jurisdiction of the Ministry of Scientific Research and Atomic Space Affairs, 2 rue Royale, Paris 8e.

Learned societies, professional institutions and other associations

Association des amateurs d'astronautique [Amateur Astronautical Association], 34 rue Richer, Paris 9e. Engages in the design, construction and launching of experimental rockets.

Association d'études pour l'expansion de la recherche scientifique [Study Group for the Expansion of Scientific Research], 29 rue l'Ulm, Paris 5e.

Association pour l'étude et la recherche astronautique et cosmique [Association for Astronautical and Cosmic Study and Research], Paris. Belongs to IAF.

Association française pour l'avancement des sciences [French Association for the Advancement of the Sciences], 28 rue Serpente, Paris 6e.

Association française d'étoiles variables [French Association for Variable Stars], Observatoire de Lyon, St. Genis Laval, Rhône.

Association française des ingénieurs et techniciens de l'aéronautique et de l'espace (AFITAE) [French Association of Aerospace Engineers and Technologists], 4 rue Cimarosa, Paris 16e. Belongs to IAF. Publishes *Technique et science aéronautique et spaciale* [" Technology and aeronautical and space science "].

Association mondialiste interplanétaire [World Interplanetary Society], 34 Grand'rue, Ferney-Voltaire, Ain.

Association nationale de la recherche technique [National Association for Technological Research], 44 rue Copernic, Paris 16e. Publishes *La recherche technique* [" Technological research "].

Centre d'études mathématiques en vue des applications [Mathematical Applications Research Centre], Institut H. Poincaré, 11 rue Pierre Curie, Paris 5e.

Centre d'études politiques, économiques et sociales de l'aéronautique et de l'astronautique [Political, Economic and Social Study Centre for Aeronautics and Astronautics], 27 quai Anatole France, Paris 7e.

Comité national français de géodésie et géophysique [French National Committee for Geodesy and Geophysics], 19 rue Auber, Paris 9e.

Comité national français de mathématiciens [French National Committee of Mathematicians], 11 rue Pierre Curie, Paris 5e.

Fédération française des sociétés de mathématiques [French Federation of Mathematical Societies], 11 rue Pierre Curie, Paris 5e.

Institut d'astrophysique [Institute of Astrophysics], 98bis boulevard Arago, Paris 14e.

Institut français de navigation [French Navigation Institute], 3 avenue Octave Gréard, 75, Paris 7e. Concerned with the development of maritime, air and space navigation.

Société astronomique de France [Astronomical Society of France], 28 rue Serpente, Paris 6e.

Société chimique de France [Chemical Society of France], 28 rue St. Dominique, Paris 7e. Belongs to IAF.

Société d'étude de la propulsion par réaction [Jet Propulsion Study Group], 1 voie des Sables, Villejuif, Seine.

Société française d'astronautique [French Astronautical Society], 47 rue Dumont d'Urville, Paris 16e. Comprises scientists, engineers and technicians associated for the advancement of astronautics. Belongs to IAF. Publishes the *Revue française d'astronautique* [" French Astronautical Review "].

Société française de droit aérien et spatial [French Society of Aerospace Law], 48 rue Copernic, Paris 16e.

Société française des électriciens [French Society of Electrical Engineers], 10 avenue Pierre Larousse, Malakoff, (92). Publishes the *Revue générale de l'électricité* [" General Review of Electrical Engineering "].

Société française des électriciens et des radio-électriciens [French Society of Electrical and Radio Engineers], 10 avenue Pierre Larousse, Malakoff, (92). Publishes *L'onde électrique* [" The Radio Wave "].

Société française de physiologie et de médecine aéronautiques et cosmonautiques [French Society for Aerospace Physiology and Medicine], 5bis avenue de la Porte de Sèvres, Paris 15e.

Société française de physique [French Physics Society], 33 rue Croulebarbe, Paris 13e. Publishes the *Journal de physique* and the *Revue de physique appliquée* [" Journal of Physics " and " Review of Applied Physics "].

Société mathématique de France [Mathematical Society of France], 11 rue Pierre Curie, Paris 5e.

Société météorologique de France [French Meteorological Society], 1 quai Branly, Paris 7e.

Foundations and trusts

Association franco-américaine atlantique, 68 rue de la Chaussée d'Antin, Paris 9e. Offers 25 postgraduate and university studentships, in fields including engineering sciences, to nationals of France and the United States of America, aged 22 to 45, for one academic year ; awards cover maintenance and fees.

Comité de secours aux étudiants ukrainiens, 27 rue des Bauves, Sarcelles, Seine-et-Oise. Offers studentships to Ukrainian refugee students, up to 30 years of age, tenable for one year in Austria, Belgium, Canada, Federal Republic of Germany, France, Italy, Spain, Switzerland, the United Kingdom, the United States of America or Yugoslavia.

Entr'aide universitaire française, Comité français de l'entr'aide universitaire mondiale, 6 rue de Tournon, Paris 6e. Offers grants to refugee students in France, aged 18 to 30, for one academic year at 320 F [17] per month.

Facultés catholiques de Lille, 60 boulevard Vauban, Lille, Nord. Offer bursaries to students of all nationalities for courses in fields including medicine and the sciences, for two to four years. Fellowships are offered to graduate nationals of UNESCO member States for research in electronics at the Institut supérieur d'électronique du Nord, and in engineering at Hautes études industrielles, for one to three years.

Institut français du pétrole, 4 avenue du Bois-Préau, Rueil-Malmaison, Seine-et-Oise. Offers 20 bursaries for research in petroleum, chemical engineering or combustion engineering to male students from any country. Tenure is one or two years at 800 F per month, plus fees.

Government or official research establishments

Bureau des longitudes [Office of Longitudes], Computing and Celestial Mechanics Service, Palais de l'Institut, 3 rue Mazarin, Paris 6e.

Centre d'enseignement et de recherches de médecine aéronautique [Aeronautical Medical Training and Research Centre], 5bis avenue de la Porte de Sèvres, Paris 15e. This is a government establishment of the health service of the Ministry for the Armies. Research has included study of the biological effects of cosmic rays, using balloons launched from the Aire-sur-l'Adour centre.

Centre d'essais de propulseurs [Propulsion Test Centre], Saclay par Jouy en Josas, Seine-et-Oise. Uses test beds simulating speeds up to mach 4 ; annex at Saint-Médard-en-Jalles, Gironde, has test facilities for solid-fuelled rockets.

Centre d'essais en vol [Flight Test Centre], B.P. No. 2, Brétigny-sur-Orge, Seine-et-Oise. Sections include aircraft, engines, telecommunications and missiles. There is a laboratory of aerospace medicine. The annex at Colomb-Béchar, Algeria, engages in rocket motor and engine tests and rocket launching.

Centre d'études géophysique [Geophysics Study Centre], Garchy-Suilly, Nièvre. Includes geophysics laboratory.

Centre français de recherches sur la gravitation [French Centre for Research into Gravitation], 28 rue Suffren, Marseille.

Centre de lancement de ballons [Balloon Launch Centre], Aire-sur-l'Adour, Landes. This CNES station is used for scientific investigations of the upper atmosphere.

Centre de recherches de Lannion [Lannion Research Centre], Lannion, Côtes-du-Nord. Operates in conjunction with the CNET space telecommunications station at Pleumeur-Bodou and the Centre d'études météorologiques spatiales de Lannion [Space Meteorological Study Centre].

Centre de recherches sur les très basses températures [Research Centre for very low Temperatures], Chemin des Martyrs, Grenoble.

Département de physique corpusculaire du Centre de recherches nucléaires [Department of Corpuscular Physics of the Nuclear Research Centre], 2 rue de Loess, Strasbourg-Cronenbourg, (67). This is a CNRS institute.

Groupe de recherches ionosphériques [Ionospheric Research Group], c/o CNET, 3 avenue de la République, Issy-les-Moulineaux, Seine.

Institut et observatoire de physique du globe du Puy de Dôme [Institute and Observatory of Terrestrial Physics], 12 avenue des Landais, Clermont-Ferrand, Puy de Dôme. This is an institute of the University of Clermont-Ferrand.

Institut de physique de l'atmosphère [Institute of Atmospheric Physics], Campistrous par Lannemezan, Hautes-Pyrénées.

Laboratoire d'astronomie spatiale [Space Astronomy Laboratory], traverse du Siphon, les trois Lucs, Marseille, Bouche-du-Rhône, (13). This is an institute of CNRS.

Laboratoire de l'énergie solaire [Solar Energy Laboratory], Fort de Montlouis, Pyrénées-orientales.

Laboratoire de physique de l'atmosphère [Atmospheric Physics Laboratory], 1 quai Branly, Paris 7e.

Laboratoire de recherches balistiques et aérodynamiques [Ballistics and Aerodynamics Research Laboratory], Vernon, Eure, (27). This is a government establishment under the Ministry for the Armies.

Musée de l'air [Aeronautical Museum], 2 rue des Vertugadins, Meudon, Seine-et-Oise.

[17] New French francs.

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Musee astronomique de l'Observatoire de Paris [Astronomical Museum of the Paris Observatory], 61 avenue de l'Observatoire, Paris 14e.

Observatoire astronomique et météorologique [Astronomical and Meteorological Observatory], 1 rue Camille Flammarion, Toulouse, (31). This is an institute of the University of Toulouse.

Besançon Observatory, Besançon, Doubs.

Observatory of Haute-Provence, Saint-Michel-de-l'Observatoire, Basses-Alpes, (04). This is an institute of CNRS.

Lyons Observatory, Saint-Genis-Laval, Rhône. Engages in photometry, spectroscopy and upper atmosphere specializations.

Marseilles Observatory, 2 place le Verrier, Marseilles 4, (13). This is an institute of the University of Marseilles.

Nice Observatory, Nice, Mont-Gros, Alpes-Maritimes. Affiliated to the University of Paris.

Paris Observatory, Meudon, 61 avenue de l'Observatoire, Paris 14e. Provides an astronomical physics service. Also at 5 place Janssen, Meudon, (92): ground observation of artificial satellites; general astrophysics service, computing and data processing service, solar system physics service, radioastronomy service and space radioastronomy service. Also at Nançay Observatory, Cher: radioastronomy station.

Observatoire et Institut de physique du globe du Pic-du-Midi [Pic-du-Midi Observatory and Terrestrial Physics Institute], 9 rue du Pont-de-la-Moulette, Bagnères de Bigorre, Hautes-Pyrénées, (65). Attached to the University of Toulouse.

Strasbourg Observatory, 11 rue de l'Université, Strasbourg.

Office national d'études et de recherches aérospatiales (ONERA) [National Establishment of Aerospace Study and Research], 29 avenue de la Division Leclerc, Châtillon-sous-Bagneux, Seine, (92). Includes divisions of aerodynamics, structures, propulsion, materials and physics; with stations at 2 rue Vertugadins, Chalais-Meudon, Seine-et-Oise; Modane, Savoie; Fort de Palaiseau, B.P. 18, Palaiseau, Seine-et-Oise; 12 rue Guy-de-Maupassant, Cannes, Alpes-Maritimes. Operates as the government establishment for aerospace research direction, development and co-ordination, with participation in study and development of aircraft and space vehicles for the benefit of the manufacturing industry, under the Ministry for the Armies.

Station de Radioastronomie de Nançay [Nançay Radioastronomy Station], Nançay, Cher. Administered by the Paris Observatory, Section of Astrophysics at Meudon, Seine-et-Oise, for study of the sun and radio sources.

INDUSTRIAL OR COMMERCIAL RESEARCH ORGANIZATIONS

AMPEX, 113 rue de l'Université, Paris 7e (satellite telemetry equipment).

Compagnie des Compteurs, 3 rue Dosne, Paris 16e.

Compagnie française Thomson-Houston - Hotchkiss-Brandt - CFTH.HB, Division radio-télévision-télécommunication, 173 boulevard Haussmann, Paris 8e (satellite telemetry and control, tracking stations).

Compagnie générale d'électricité, 54 rue La Boétie, Paris 8e.

Compagnie générale de télégraphie sans fil, 47 rue Dumont d'Urville, Paris 16e (satellite telemetry and control stations).

Compagnie industrielle des télécommunications, 33 rue Emeriau, Paris 15e (satellite telemetry equipment).

Electronique Marcel Dassault, 55 quai Carnot, Saint-Cloud (satellite construction, equipment and testing).

Engins MATRA (Mécanique, aviation, traction), 49 avenue de Lisbonne, Paris 8e (satellite structures and components).

Générale aéronautique Marcel Dassault, 78 quai Carnot, Saint-Cloud.

Intertechnique, B.P. No. 1, Plaisir, (78).

Société alsacienne de constructions atomiques, de télécommunications et d'électronique (ALCATEL), 157 avenue de Neuilly, Neuilly/Seine, (92).

Société anonyme de télécommunications, 40 avenue de New York, Paris 16e (solar cells and satellite power systems).

Société d'applications générales d'électricité et de mécanique, 6 avenue d'Iéna, Paris 16e (satellite instrumentation and control).

Société Bréguet, B.P. 12, Velizy-Villacoublay (satellite components).

Société d'entreprises générales et électroniques, 27 rue de Marignan, Paris 8e (satellite telemetry equipment).

Société d'études et d'applications vide optique mécanique, 30 rue Raspail, Argenteuil (space simulators).

Société d'études de la propulsion par réaction, 1 voie des Sables, Villejuif, Seine, (94) (solid and liquid propellant rocket motors for space vehicles and aircraft; applications to satellites; instrumentation).

Société d'études de réalisation d'exploitation thermique et électrique, 164 rue de Rivoli, Paris 1e (satellite telemetry equipment).

Société d'exploitation pour la mise en œuvre d'engins spatiaux, 9 rue Réamur, B.P. 12, 92-Plessis-Robinson (development of space vehicles generally, launching sites and tracking).

Société d'instrumentation Schlumberger/Rochar électronique, 42 rue Saint-Dominique, Paris 7e (satellite telemetry).

Société nationale de constructions aéronautiques nord-aviation, 12bis avenue Bosquet, Paris 7e (satellite telemetry and control stations).

Société nationale de constructions aéronautiques sud-aviation, 37 boulevard de Montmorency, Paris 16e.

Société nationale de constructions aéronautiques sud-aviation, Laboratoire de physique appliquée, 12 rue Pasteur, Suresnes (telemetry transmission).

Société nationale d'études et de construction de moteurs d'aviation, 150 boulevard Haussmann, Paris 8e (scientific, technical and industrial departments; atomic, electronic and space propulsion divisions).

Société pour l'étude et la réalisation d'engins balistiques, 55 rue Victor Hugo, Courbevoie, (92).

Société pour le perfectionnement des matériels d'équipements aérospatiaux, 1 rue Victor Hugo, Issy-les-Moulineaux, Seine, (92) (test laboratories for aerospace equipment; climatic, mechanical and environmental testing).

Société technique d'applications et de recherches électroniques, 12-14 avenue Carnot, Massy (satellite tracking).

Universities and colleges

Many fellowships and studentships are available, but most are reserved for French nationals. For details of grants available to French nationals and to students at French universities for study and research in other countries, see the UNESCO publication, *Study Abroad*.[18] Information on awards for foreign students to study or undertake research in France is given below.

The Service des relations universitaires du centre national d'études spatiales [Service for University Relations of the National Centre for Space Studies] provides information for students from all over the world interested in space studies.

The French Ministry for Foreign Affairs, Direction générale des affaires culturelles et techniques, 23 rue la Pérouse, Paris 16e, offers scholarships for university study in France to nationals of most countries. These are intended for postgraduate or specialized study for persons up to 30 years of age. Tenure is from one month to a few years, at 480 F per month, plus fees and certain allowances. Application must be made to the cultural service of the French diplomatic representative in the country of the applicant.

Ministry of Co-operation, Office de coopération et d'accueil universitaire, 69 quai d'Orsay, Paris 7e, offers scholarships to students from Madagascar and African countries for advanced studies in France. Tenure is for the duration of the course of studies, renewable annually, varying up to 5,400 F annually for normal scholarships or 7,800 F for specialized courses.

Collège de France, 11 place Marcelin Berthelot, Paris 5e. Offers courses in nuclear magnetism, physical methods of astronomy, nuclear physics, mathematics, mechanics, theoretical astronomy, atomic physics and theoretical physics of particles. There are chairs of theoretical astrophysics and physical methods in astronomy.

Ecole centrale des arts et manufactures [Central School of Crafts and Manufactures], 1 rue Mongolfier, Paris 3e.

Ecole nationale supérieure de l'aéronautique (ENSA) [National School for Advanced Aeronautics], 32 boulevard Victor, Paris 15e. ENSA laboratories include research and study centres for automation, thermodynamics, microwaves and aerothermodynamics; general training in aeronautical engineering, specialist training in aerospace engineering and postgraduate courses. Students' projects have included a satellite launcher. Graduate engineers employed in industry, as well as full-time graduate students, may attend courses, usually of one or two weeks' duration but sometimes of longer duration. Subjects include modern mathematical methods, automation and servomechanisms, aerothermodynamics, electronics and radio engineering, ballistic missiles and space vehicles. Courses include lectures, design and practical work, and short training periods may be spent in French aeronautical centres. After at least 250 hours of attendance and submission of a thesis, the degree of master of aeronautical sciences may be awarded.

Ecole nationale supérieure des télécommunications [National School of Advanced Telecommunications], 46 rue Barrault, Paris 13e. Operates under the Ministry of Posts and Telecommunications.

Ecole normale supérieure, 24 rue Lhomond, Paris 5e. Includes department of sciences and laboratory of physics. Engages in study of ionospheric perturbations. Includes sections of radiofrequency spectroscopy, physics of solids and geophysics.

Ecole polytechnique, 21 rue Descartes, Paris 5e. Offers mathematics, physics, chemistry, mechanics and astrophysics; includes a laboratory of solid state physics and laser group. The school comes under the Ministry for the Armies.

Ecole supérieure d'électricité, 10 avenue Pierre Larousse, Malakoff, Seine, (92). Offers final-year students courses in space electronics, including propagation, celestial noise, antenna design, radioastronomy, tracking equipment, telemetry, data storage and transmission, amplification of weak signals, automation, simulation, microminiaturization and reliability.

Institut national des sciences et techniques nucléaires [National Institute of Nuclear Science and Technology], B.P. No. 6, Gif-sur-Yvette, Seine-et-Oise. Co-operates with the universities in providing courses in nuclear engineering, reactor theory, radio-biology etc. Students' projects have included a nuclear reactor that would be launched in a satellite.

University of Aix and Marseilles, 38 cours Mirabeau, Aix-en-Provence. Faculty of Sciences at Marseilles offers mathematics, physics, chemistry, mechanics, electronics and radio-electricity, atomic and molecular physics, astronomy, meteorology and atmospheric mechanics, aeronomy, terrestrial physics and astrophysics, and includes a Space Physics Laboratory at traverse de la Barasse, Marseille, (13). University institutes include the Institute of Fluid Mechanics, 1 rue Honorat, Marseille, (13).

Besançon University, 8 rue de la Convention, Besançon. Faculty of Sciences offers mathematics, physics, mechanics, chemistry and astronomy.

Bordeaux University, 29 cours d'Albret, Bordeaux. Faculty of Sciences offers mathematics, physics, chemistry, nuclear physics and astronomy. The university observatory is at Floirac, Gironde. The university offers bursaries to students from all countries and, reciprocally, to those from Hamburg University, Federal Republic of Germany. The bursaries are for study and

[18] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

research in all fields, including law, medicine and science. Tenure is nine months, with free board and lodgings in the Cité universitaire, plus 200 F per month.

Grenoble University, 7 place Bir-Hakeim, Grenoble. Faculty of Sciences offers mathematics, physics, electrotechnology and electronics. University includes the Ecole nationale supérieure d'électrotechnique, d'hydraulique, de radioélectricité et de mathématiques appliquées [National School of Advanced Electrotechnology, Hydraulics, Radioelectricity and Applied Mathematics], 46 avenue Félix-Viallet, Grenoble, (38).

Lille University, 29 rue des Jardins, Lille. Faculty of Science offers mathematics, physics, electronics, radioelectricity, fluid-mechanics and astronomy. The astronomical laboratories at 1 rue du Faubourg de Douai, Lille.

Lyons University, 30 rue Cavenne, Lyons. Faculty of Science offers mathematics, physics, chemistry, nuclear physics, atmospheric physics and astronomy. There is an astronomical observatory. The university offers exchange studentships to nationals of the Federal Republic of Germany at the Universities of Frankfurt (2) and Erlangen (1), and to nationals of Italy at the University of Genoa. Candidates must be enrolled in those universities and must have a good knowledge of French. Tenure is one academic year and the grant covers all expenses except travel.

Montpellier University, 2 rue du Faubourg-Saint-Jaumes, Montpellier, Héraut. Faculty of Science offers mathematics, physics, chemistry. spectroscopy, geophysics and astronomy.

University of Paris, Sorbonne, 47 rue des Ecoles, Paris 5e. Faculty of Science in Paris and Orsay offers mathematics, physics, electronics, optics, quantum physics, relativity, geophysics, ionospheric physics, meteorology, mechanics, atomic and nuclear physics, fluid mechanics, thermodynamics, celestial mechanics, astronomy, wave mechanics, plasma physics, solid state physics, geodynamics, spectroscopy, celestial physics, aviation, astrophysics, atmospheric dynamics and atmospheric physics. The Laboratories of Fundamental Astronomy and Astrophysics (18bis boulevard Arago, Paris 14e), the Laboratory of Plasma Physics and the Institute of Electronics (Centre d'Orsay, (91)), the Laboratory of Lower Atmosphere Physics (1 place Aristide Briand, Bellevue, (92)), the Institute of Terrestrial Physics (191 rue St. Jacques, Paris 5e), the Laboratory of Exosphere Physics (15 rue Georges Clémenceau, Orsay, (91)), the Laboratory of Physical Chemistry (allée Jean-Perrin, Orsay, (91)) and the Laboratory of Atmospheric Physics (1 quai Branly, Paris 16e), engage in space science research. University institutes include Palais de la découverte [Palace of Discovery], avenue Franklin D. Roosevelt, Paris 8e, a museum for the popularization of science, with departments of mathematics, physics and astronomy and a planetarium and the Centre d'études supérieures de mécanique [Advanced Study Centre for Mechanics], 1 avenue du général Balfournier, Paris 16e, offering postgraduate courses in aerothermodynamics.

Poitiers University, 5 Cité de la Traverse, Poitiers. Includes Faculty of Sciences and Laboratory of Upper Atmospheric Physics, chemin des sables, Poitiers, (86). University institutes include Ecole nationale supérieure de mécanique et d'aérotechnique [National School of Advanced Mechanics and Aerotechnics], rue Guillaume-le-troubadour, Poitiers, (86).

Rennes University, 19 boulevard de Sévigné, Rennes. Includes Faculty of Science, Laboratories of Radioelectricity and Spectroscopy, both at 1 quai Dujardin, Rennes, (35), engage in space research. Exchange studentships for one academic year are offered to students at Kiel University, Federal Republic of Germany (330 F plus scholarship fees), at the Universities of Aberdeen and Exeter, United Kingdom (£300), and at Rochester University, United States of America (200 F plus scholarship fees). Research grants for one, two or six months are offered to students from all countries.

Strasbourg University, 6 rue de la Toussaint, Strasbourg. Faculty of Science offers mathematics, physics, chemistry, fluid mechanics, mechanics, nuclear physics, astronomy, terrestrial physics and geophysics. The Corpuscular Physics Laboratory engages in space research. University institutes include an Astronomical Observatory and an Institute of Nuclear Research.

Toulouse University, 20 rue Saint-Jacques, Toulouse. Faculty of Sciences includes mathematics, physics, mechanics, chemistry, electronics, nuclear physics, astronomy, geophysics and spectroscopy. The Space Radiation Study Centre (118 route de Narbonne, Toulouse, (31)), the Terrestrial Physics Laboratory (118 route de Narbonne, Toulouse, (31)) and the Electron Physics Service engage in space research. University institutes include the Ecole nationale supérieure d'électrotechnique, d'électronique et d'hydraulique de Toulouse [National School of Advanced Electrotechnology, Electronics and Hydraulics of Toulouse], 2 rue Camichel, Toulouse, (31), with a laboratory of electrical engineering; an institute of fluid mechanics and the National School of Aeronautical Engineering, 49 avenue Léon Blum, Toulouse. Space research centres are being developed.

French Guiana

Government or official research establishments

Centre spatial, Base de kouron [Space Centre, Kouron Base]. Attached to the Centre national d'études spatiales (CNES) [National Space Study Centre], Paris, France. Comprises a firing range, tracking stations and rocket-launching base.

Ghana

National and State academies

Ghana Academy of Sciences, P.O. Box M 32, Accra. Includes section of physical sciences.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Ghana National Science Museum, P.O. Box 82, Legon, near Accra.

Meteorological Services Department, P.O. Box 744, Accra.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Ghana Science Association, University of Ghana, P.O. Box 25, Legon, near Accra.

UNIVERSITIES AND COLLEGES

University College of Science Education, Cape Coast. Faculty of Science offers mathematics and sciences.

University of Ghana, P.O. Box 71, Legon, near Accra. Faculty of Science offers physics, mathematics, biochemistry and geology. Research projects in the physics department include ionospheric research, especially ionospheric irregularities, total electron count by Faraday rotation, ionospheric propagation and ionospheric drifts.

University of Science and Technology, Kumasi. Includes faculties of engineering and of applied science and technology.

Scholarships under the United Nations programme are available to students from Non-Self-Governing Territories for study at the University of Ghana or the University of Science and Technology, and from South West Africa and territories under Portuguese administration, for study at the secondary or university level. Tenure is usually three years, and awards cover maintenance, travel and certain other allowances.

For information on awards available to nationals of Ghana, for study or research in other countries, see the UNESCO publication, *Study Abroad*.[19]

Greece

NATIONAL AND STATE ACADEMIES

Athens Academy, Odos Panepistimiou, Athens. Includes section of positive sciences: and research and computing centre making a statistical study of variation of different indices of solar activity within each sunspot cycle and from cycle to cycle.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Hellenic National Meteorological Service, Cholargos, Athens. Activities include high altitude observations, upper air studies and telecommunications.

Scientific Rocket Research Group on Space, 14 Hermes Street, Athens. This non-profit scientific organization dealing with space research is recognized by the Greek Government; it works in co-operation with the National Meteorological Service and other Greek official services in space science measurement and research programmes.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Hellenic Astronautical Society, 16 Voulis Street, Athens.

Hellenic Mathematical Society, 34 Odos Panepistimiou, Athens 143.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Laboratory of Astronomy, University of Athens, Odos Solonos 57, Athens.

National Observatory, Lophos Nymphon, Athens. Includes Astronomical, Meteorological, Geodynamical and Ionospheric Institutes.

UNIVERSITIES AND COLLEGES

Akro Missile Training Centre of NATO, Akro, Canea, Crete.

University of Salonika, Odos Panepistimiou, Salonika. Faculty of Physics and Mathematics offers physics, mathematics, astronomy and meteorology.

National and Capodistrian University of Athens, Odos Panepistimiou, Athens. Includes faculties of Mathematics and Physics.

National Technological University, Odos 28 Octovriou 42, Athens. Offers astronomy, physics, mathematics, telecommunications, electronics, geodesy and nuclear engineering.

The Ministry of Education and Arts, Athens, offers a number of bursaries for advanced study to graduates from Turkey, the United Arab Republic and Yugoslavia and certain countries of western Europe, nominated by the authorities of their countries for study in Greece. Tenure is ten months (renewable) at 3,500 drachma per month plus travel expenses.

Scholarships are offered, under the United Nations programme, to students from dependent countries who have completed secondary education, for study in Greece of subjects including navigation, mechanics, electricity and electronics. Tenure is two to three years, plus one year to study Greek, at 16,800 drachma annually. The Foundation of State Bursaries, 14 Lysicrates Street, Athens, offers scholarships in some cases to foreigners of Greek origin for study in subjects including physical sciences.

For information on fellowships and study grants for Greek nationals or graduates of Greek universities, see the UNESCO publication, *Study Abroad*.[20]

[19] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[20] *Ibid.*

Guinea

Universities and colleges

Conakry Polytechnic Institute, Conakry. Includes Faculties of Science, Geology and Electrical Engineering. Built, equipped and financed by the USSR.

Hungary

National and State academies

Hungarian Academy of Sciences, Roosevelt tér 9, Budapest, V. Publications include *Acta Physica, Acta Technica, Acta Mathematica.* Includes Mathematical and Physical Sciences and Technical Sciences Departments.

Learned societies, professional institutions and other associations

Bolyai János Mathematical Society, Szabadság-tér 17, Budapest V.

Eötvös Loránd Society of Physics, Szabadság-tér 17, Budapest V.

Scientific Society of Telecommunications, Szabadság-tér 17, Budapest V.

Association of Hungarian Geophysicists, Szabadság-tér 17, Budapest V.

Hungarian Meteorological Society, Szabadság-tér 17, Budapest V.

Society for the Popularization of Scientific Knowledge, Bródy Sándor utra 16, Budapest VIII.

Hungarian Astronautical Association (MTESZ), Szabadság-tér 17, Budapest V. Belongs to IAF.

Government or official research establishments

Eötvös Loránd State Geophysical Institute, Népstadion út 99, Budapest XIV. Attached to the institute is a geomagnetic observatory at Lake Balaton, Tihany.

Hungarian Institute of Meteorology, Kitaibel Pál-utca 1 (P.O. Box 114), Budapest II. Includes aerological observatory and library provides ionospheric data.

Institute of Nuclear Research of the Hungarian Academy of Sciences, Bem-tér 18/C, Debrecen. Conducts basic research in nuclear reactions and nuclear spectroscopy.

Research Group for Theoretical Physics of the Hungarian Academy of Sciences, Budafoki-út 8, Budapest XI. Conducts research particularly into the many-body problem.

Geophysical Research Laboratory of the Hungarian Academy of Sciences, Múzeum utca 6, Sopron. Conducts research in general and applied geophysics, as well as observations and study of the variations in the electromagnetic field of the earth.

Konkolyi Observatory of the Hungarian Academy of Sciences, Szabadsághegy, Konkoly-Thege Miloós-útca 13-17, Budapest XII. Mountain station at Piszkéstetö, u.p. Galyatetö. Publications include " Information bulletin on variable stars, Commission 27 of IAU ", and " Mitteilungen der Sternwarte Budapest ". Research interests include variable stars, photoelectric photometry, supernovae, stellar statistics and tracking of artificial satellites. Instruments include a 36-24-inch Schmidt telescope, 24-inch and 20-inch reflectors, and 24-inch objective prisms of 2° and 5°.

Central Research Institute of Physics of the Hungarian Academy of Sciences, Konkoly-Thege Mikos út, Budapest XII. Departments of Electronics and Mathematics ; and laboratories for optics, cosmic rays, nuclear and reactor physics, solid state physics, and radio-chemistry.

Mathematical Institute of the Hungarian Academy of Sciences, Reáltanoda u. 13-15, Budapest V. Conducts advanced training and research in pure and applied mathematics.

Solar Physics Observatory of the Hungarian Academy of Sciences Debrecen. Equipped with 10-inch Merz refractor, photoheliograph and spectrohelioscope.

Uránia Observatory of the Society for the Popularization of Scientific Knowledge, Sánc-utca 3B, Budapest I. Instruments include a 16-inch Nasmyth reflector and an 8-inch Heyde refractor.

Universities and colleges

The Hungarian Ministry for Foreign Affairs, Bem rakpart 47, Budapest V, offers bursaries under the United Nations programme to students from dependent territories for advanced studies in Hungary. Tenure is four to six years, at 850 forints per month, plus travel expenses.

The Ministry of Culture, Szalay utca 10-14, Budapest V, offers scholarships for advanced study in Hungary to nationals of countries with which cultural or scientific conventions have been effected. Candidates should have completed a secondary education, be between 18 and 26 years of age, and know German, French, English or Russian. Tenure is for the duration of the studies, plus one year for learning Hungarian.

Fellowships are offered to British graduate students and research workers for study and research in Hungary. Tenure is ten months, and the awards cover accommodation, maintenance and certain other expenses ; return travel is payable by the British Council.

Exchanges for scientific and technological personnel, university staff and graduate students have been agreed with the British Council, 65 Davies Street, London, W.1.

Technical University of Budapest, Müegyetem-rkp. 3, Budapest XI. Faculty of electrical engineering offers fundamental training in telecommunications, telemetry and microwave theory.

Debrecen University of Medicine, Debrecen ; previously the Faculty of Medicine of Kossuth Lajos University. Offers fundamental training in radiation biology.

Eötvös Loránd University, Egyetem-tér 1, Budapest V. Faculty of Science, Múzeum-körút 6-8, Budapest VIII, offers fundamental training in applied mathematics, pure and applied geophysics, meteorology, astronomy, celestial mechanics, nuclear physics. Geophysics

Department offers advanced training in geophysics. Mineralogical Department offers advanced training and special studies in meteorites.

Technical Institute of Building and Transport Engineering, Müegyetem-rkp. 3, Budapest XI. Faculty of Civil Engineering offers fundamental and advanced geodesy and geophysics.

University of Szeged, Dugonics tér 13, Szeged. Faculty of Science offers mathematics, physics and climatology. Includes Institutes of Experimental and Theoretical Physics.

Kossuth Lajos University, Debrecen 10. Department of Science offers mathematics, physics and meteorology.

Studentships are offered to nationals of France for advanced studies.

India

National and State academies

Indian Academy of Sciences, Hebbal P.O., Bangalore 6.

National Academy of Sciences, Allahabad.

National Institute of Sciences of India, Mathura Road, New Delhi 1.

Rajasthan Academy of Sciences, Pilani.

Government departments and official agencies

Council of Scientific and Industrial Research, Rafi Marg, New Delhi. Responsible to the Department of Scientific Research of the Ministry of Education, and controlling thirty-four national research laboratories, including the following:

National Physical Laboratory of India, Hillside Road, New Delhi (fundamental and applied research in physics);

Central Electronics Engineering Research Institute, Pilani, Rajasthan;

Birla Industrial and Technological Museum, 19 Gurusaday Road, Calcutta 19;

National Aeronautical Laboratory, Kodihalli, Bangalore 17 (includes metal fatigue research);

Central Scientific Instruments Organization, 30 Bay Building, Sector 17, Chandigath, Punjab;

National Geophysical Research Institute, Hyderabad; (field, laboratory and theoretical studies);

Visvesvaraya Industrial and Technological Museum, Kasturba Road, Bangalore;

Mafatlal Scientific and Technological Museum.

Indian Meteorological Department, Lodi Road, New Delhi 3. The department has offices for climatology and geophysics at Poona; and conducts research into meteorology, terrestrial magnetism, atmospheric physics, astrophysics, solar physics, stellar astronomy and radio-astronomy. A meteorological observatory and a magnetic observatory are located in Trivandrum City, and a magnetic observatory in Annamalainagar. Kodaikanal Mountain Station Astrophysical Observatory undertakes geophysical and solar physics observations and radio-astronomy; also ionospheric, magnetic, atmospheric ozone and cosmic ray observations.

Indian National Committee for Space Research (INCOSPAR), c/o Physical Research Laboratory, Ahmedabad, Gujarat. Advises the Government on the promotion of research in and exploration of space and its utilization for peaceful purposes, promotes international co-operation in space research and exploration and in the peaceful uses of outer space, maintains contact with the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU), the Commonwealth Consultative Space Research Committee and other national and international organizations with similar interests, and advises the Government on its participation in the work of the United Nations Committee on the Peaceful Uses of Outer Space and in other international organizations.

INCOSPAR was responsible for the establishment of the Thumba Equatorial Rocket Launching Station and the collaboration in the programme carried out there by NASA of the United States of America, CNES of France and the USSR hydrometeorological service.

Learned societies, professional institutions and other associations

Aeronautical Society of India, 13B Indraprastha Estate, New Delhi. This professional organization is dedicated to the furtherance of aeronautical science in India.

Allahabad Mathematical Society, Lakshmi Niwas, George Town, Allahabad.

Bharata Ganita Parishad (formerly Benares Mathematical Society), Department of Mathematics and Astronomy, The University, Lucknow.

Calcutta Mathematical Society, 92 Acharya Prafulla Chandra Road, Calcutta 9.

Indian Association for the Cultivation of Science, Jadavpur, Calcutta 32.

Indian Astronautical Society, 2647 V.V. Mohalla, Mysore. Belongs to IAF.

Indian Mathematical Society, Hans Raj College, Delhi 7.

Indian Science Congress Association, 64 Dilkhusa Street, Calcutta 17.

Government or official research establishments

Alipore Observatory and Meteorological Office, Calcutta.

Astronomical Observatory, Presidency College, Calcutta.

Astronomical Observatory of St. Xavier's College of the University of Calcutta, 30 Park Street, Calcutta.

Astrophysical Observatory, Kodaikanal, S. India. Deals with solar physics, stellar physics and radio-astronomy.

Bose Research Institute, 93/1 Acharya Prafulla Chandra Road, Calcutta 9. Includes a high-altitude

laboratory at Darjeeling. Research interests include radiation and nuclear physics.

Gulmarg Research Observatory, Gulmarg, Kashmir. Sponsored by Aligarh Muslim University and the University of Jammu and Kashmir. Conducts studies in meteorology, cosmic rays, atmospheric physics, infra-red spectroscopy and radio-activity.

Institute of Radiophysics and Electronics, 92 Acharya Prafulla Chandra Road, Calcutta. Operates an ionosphere field station at Haringhata, and includes the postgraduate teaching and research department of the faculty of technology of the University of Calcutta. Offers a three-year M.Tech. course in radiophysics and electronics, and research opportunities in ionosphere physics, radio-wave propagation and electronics.

Institute of Science, Mayo Road, Fort, Bombay 1. Employs research assistants and awards scholarships and fellowships; a constituent college of the University of Bombay.

Nizamiah Observatory, Begumpet, Hyderabad 16, Andhra Pradesh; under the control of Osmania University.

Observatory of Geodesy and Geophysics, Geodetic and Research Branch, Survey of India, Dehra-Dun.

Physical Research Laboratory, Ahmedabad 9, Gujarat State. Offers postgraduate studies and research in experimental and theoretical physics, atmospheric physics and astrophysics; research leading to Ph.D. degree. In the near future will engage in design, operation and maintenance of a satellite communication earth terminal. A cosmic ray observation station is maintained in Trivandrum, and the laboratory works in close cooperation with the Thumba Equatorial Rocket Launching Station.

Saha Institute of Nuclear Physics, 92 A.P. Chandra Road, Calcutta 9. Conducts teaching and research in nuclear science.

Shree Jiwaji Observatory, Ujjain, Madhya Pradesh. Equipped with both ancient Indian astronomical instruments and modern instruments. A two-year certificate course is offered in astronomy, combining both ancient and modern astronomy.

Tata Institute of Fundamental Research, Colaba, Bombay 5. This national research centre of the Government of India is recognized as a postgraduate institute of the University of Bombay. Conducts fundamental research in mathematics, nuclear science and space science; uses experimental techniques with plastic balloons.

Thumba Equatorial Rocket Launching Station (TERLS), Trivandrum, Kerala State, is operated by the Indian National Committee for Space Research, and has been accorded United Nations sponsorship as an international facility for the world scientific community for peaceful investigations of space. Advisory panel membership includes representatives of India, France, the United States of America, the USSR and the Outer Space Affairs Group of the United Nations. Internationally supported training is provided for direct application in specific and useful projects or programmes of the trainee's country, with institutions in the trainee's country contributing to a measurable extent towards the cost of training. Seminars are held at two levels to generate interest and capability among specialists, scientists and engineers for experiment with sounding rockets. The first level consists of meetings of three or four days to hear and discuss review papers on scientific subjects; at the second level, small working groups of those actually engaged in space research present and discuss details of techniques in seminars lasting two to four weeks. UNESCO has assisted financially. Training is also provided for countries which may wish to establish their own launching ranges, to provide their personnel with general range experience.

Training covers rocket assembly, firing range safety, wind weighting, ground support through radar, telemetry, dovap and digital computing. Laboratory and office space, workshops, library, classrooms and living accommodation for scientist, technicians and trainees are being provided to enlarge the potential as an international training centre.

Trivandrum Space Science and Technology Centre, Trivandrum, Kerala State. Engaged in rocket payload construction, environmental testing and data processing.

Universities and colleges

Aligarh Muslim University, Aligarh, Uttar Pradesh. Offers mathematics, physics and astronomy; is co-sponsor of Gulmarg Research Observatory, Gulmarg, Kashmir.

Andhra University, Waltair, Andhra Pradesh, South India. Department of Meteorology and Oceanography offers courses up to M.Sc. level. Physics Department, Ionosphere and Space Research Laboratory, Visakhapatnam 3, includes ionosphere physics in M.Sc. courses. The laboratory specializes in ground-based research on ionospheric drifts, absorption, polarization and spreads. A project involving rocket exploration of the ionosphere has been undertaken at Tumba Equatorial Rocket Launching Station, and lower ionosphere exploration using ground transmitter and rocket receiver techniques is proposed.

Birla Institute of Technology, P.O. Mesra, Ranchi. Department of Space Engineering and Rocketry was established in 1963-1964 with assistance from NASA and the United States Government. A two-year postgraduate M.Sc. course is offered in space engineering and rocketry, supported by funds from the Hindustan Charity Trust, Calcutta. Scholarships of 400 rupees per month with 500 rupees travel grants are available to all selected students. Hostel accommodation is provided in the institute campus. Departments of Mechanical, Electrical and Electronic Engineering have laboratories and other facilities for postgraduate and advanced work.

Gorakhpur University, Gorakhpur, Uttar Pradesh. Faculty of Science, Department of Physics, offers postgraduate studies and research leading to M.Sc. and Ph.D. degrees in experimental and theoretical physics. Advanced courses are available in astrophysics, spectroscopy and molecular structure, luminescence, light-

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scattering and molecular biophysics, microwave and solid state electronics, and X-ray diffraction. A 6-inch reflecting telescope has recently been installed for training in astrophysics and space physics.

Gujarat University, Navrangpura, Ahmedabad 9, Gujarat State. Includes Faculties of Science and Technology. Recognized institutions include the Physics Research Laboratory, with facilities for X-ray studies of crystals, offering M.Sc. courses in nuclear physics and solid state physics. Electronics and Radio Propagation Laboratory of Department of Physics offers M.Sc. courses in radio physics and electronics, with Ph.D. opportunities in techniques, ionosphere, geomagnetism and wave propagation research. Fellowships are available to Indian nationals.

Awards available to nationals of all countries include 10 research scholarships of 200 rupees per month open to candidates undertaking research for Ph.D. degrees ; 14 research fellowships of 200 rupees per month open to students doing research in the departments of science, and 30 merit scholarships of 20 rupees per month open to deserving postgraduate students.

Indian Air Force School of Aviation Medicine, Bangalore.

Indian Institute of Science, Bangalore 12, South India. Department of Aeronautical Engineering offers research for M.Sc. and Ph.D. degrees and postgraduate courses for M.Eng. degrees in aircraft structures and aerodynamics. Department of Electrical Communication Engineering offers research and postgraduate courses in communications theory, electronics, acoustics and microwaves ; Department of Applied Mathematics offers theoretical research in astrophysics, plasma physics, magnetohydrodynamics and fluid mechanics ; Department of Physics offers research in spectroscopy, magnetic resonance, and low temperature physics. Numerous fellowships, studentships and grants are available to Indian nationals.

Indian Institute of Technology, Powai, Bombay 76, Maharashtra State. Offers degree courses in scientific and technological subjects, including aeronautical engineering.

Indian Institute of Technology, Kanpur, Uttar Pradesh. Offers degree courses in scientific and technological subjects, including aeronautical engineering.

Indian Institute of Technology, Kharagpur, P.O. Kharagpur Technology, West Bengal. Offers degree courses in scientific and technological subjects, including aeronautical engineering, physics and meteorology.

Indian Institute of Technology, New Delhi 16. Offers degree courses in scientific and technological subjects ; a course in aeronautical engineering is projected.

Jadavpur University, Calcutta 32. Includes Faculties of Science and Engineering. Department of Physics includes research in the time variation of cosmic ray intensity and investigation of rainborne natural radio-elements and radio-active fall-out. Department of Mathematics offers postgraduate courses including space dynamics, and conducts theoretical research in fuel consumption in conservative space flights, and optimum studies in space navigation.

Madras Institute of Technology, Chromepet, Madras 44, South India. Offers degree courses in scientific and technological subjects. Department of Aeronautical Engineering offers first degree courses. Institute includes a Department of Electronics and Instrument Technology.

Maharaja Sayajirao University of Baroda, Baroda 2, Gujarat State. Offers courses in meteorology. Physics Department of the faculty of science offers a two-year postgraduate course for the M.Sc. degree in electronics and radio physics, solid state physics, nuclear physics and spectroscopy. The department has an 8-inch diameter refracting astronomical telescope with revolving dome for observing the planets.

Osmania University, Hyderabad, Nadhra Pradesh. Faculty of Science offers mathematics, physics and astronomy ; faculty of engineering offers electronics and telecommunications ; Department of Genetics undertakes research in biological effects of cosmic radiation, using balloon flights in co-operation with the Tata Institute of Fundamental Research. M.Sc. degrees in radiation biology are awarded.

Punjab University, Chandigarh 3, Punjab. Punjab engineering colleges offer degree courses in aeronautical engineering.

University of Bombay, Bombay 1. Constituent colleges include Institute of Science, Mayo Road, Fort, Bombay 1. Recognized postgraduate institutes include Atomic Energy Establishment, Trombay, Bombay 73, and Tata Institute of Fundamental Research, Colaba, Bombay 5.

University of Calcutta, Calcutta 12. Includes University College of Science and Technology.

University of Kerala, Trivandrum, Kerala State. University colleges include College of Engineering, Government Polytechnic, Kalamassery and Maharajah's Technological Institute, Tuchur. The university has proposed a postgraduate course in space science and space engineering, with which the College of Engineering, Trivandrum, will be closely associated.

University of Lucknow, Lucknow, Uttar Pradesh. Offers mathematics and astronomy at Bharata Ganita Parisad.

University of Poona, Ganeshkhind, Poona 7. Department of Physics offers facilities for study and research up to Ph.D. level. It has participated in the IGY, IGC and IQSY programmes, with research in night airglow, zodiacal light, etc., and in atmospheric noise in the low frequency and very low frequency regions. Up to six fellowships and scholarships for research students can be made available, and accommodation can be arranged.

University of Roorkee, Roorkee, Uttar Pradesh. Offers courses in meteorology and operates a meteorological observatory.

University of Saugar, Saugar, Madhya Pradesh. Offers courses in physics and meteorology, and operates a meteorological observatory.

A limited number of trainees from other countries would be accepted tuition-free at Indian national institutions, but such trainees would need international fellowships to cover travel and other costs.

The Commonwealth Scholarship and Fellowship Plan offers awards to citizens of Commonwealth countries for postgraduate study and research at any recognized university or institution of higher learning in India. Tenure is two years at 450 rupees monthly for fellows, 250 for scholars, plus travel, tuition and other grants. Awards for undergraduate study may be made to students from countries in which study facilities are not available. Awards are also available for short-term visits of senior educationists.

Government awards for doctoral, post-doctoral or graduate study in India are offered on a reciprocal basis to graduates from Austria, Argentina, Belgium, Brazil, Chile, Czechoslovakia, Denmark, Finland, Eastern Germany, Hungary, Italy, the Netherlands, Norway, Paraguay, Spain, Sweden, Switzerland and Uruguay. They are also offered to qualified students from Bulgaria, Poland and Yugoslavia. Tenure is up to two years, at 450 rupees monthly for fellows, 250 for scholars, plus certain other expenses.

Government fellowships (6) of 500 rupees per month for two years are open to graduates from France; scholarships (10) for postgraduate study are open to students from the Federal Republic of Germany.

Exchange scholarships (10) of 300 rupees monthly for two years, plus tuition and some other expenses, are offered to qualified students from the United Arab Republic. Scholarships (15) of 250 rupees monthly for six to twelve months, plus tuition, fees and other expenses, are offered to nationals of the USSR.

Under the United Nations programme, scholarships of 250 rupees monthly are available to students from Non-Self-Governing Territories, South West Africa and territories under Portuguese administration, for university study or technical and vocational training in India.

The Ministry of External Affairs, New Delhi, offers a Punjab government scholarship for study for a bachelor's degree in engineering at Chandigarh, Punjab State. Tenure is one year (renewable to end of course) at 200 rupees per month, plus tuition, free hostel accommodation and vacation grant.

For information on fellowships and study grants available to nationals of India, and graduates from Indian universities, see the UNESCO publication *Study Abroad*.[21]

Indonesia

Government departments and official agencies

Meteorological and Geophysical Service, 5 Djalan Geredja Inggeris 3, Djakarta, Java.

Learned societies, professional institutions and other associations

Astronomical Association of Indonesia, Djalan Lembong 14, Bandung, Java. Possesses an astronomical observatory.

Meteorological and Geophysical Institute, Djalan Geredja Inggeris 3, Djakarta, Java.

Government or official research establishments

Observatorium Bosscha, Lembang; associated with the Institute of Technology at Bandung, Java.

Universities and colleges

Bandung Institute of Technology, Djalan Ganeca 10, Bandung, Java. Includes Departments of Astronomy, Mathematics, Physics, Meteorology and Geophysics.

Gadjah Mada University, Bulaksumur, Jogjakarta, Java. Includes Faculties of Engineering and Mathematics.

Indonesia University, Djan Salemba 4, Djakarta, Java, with Faculties of Mathematics and Technology in Bandung.

The Ministry of Foreign Affairs, Djakarta, offers scholarships for postgraduate study and research in Indonesia to graduate nationals of China (mainland), Czechoslovakia, Eastern Germany, the Federal Republic of Germany, France, Italy, Poland, the United Arab Republic, the United Kingdom, the United States of America, the USSR and Yugoslavia. Tenure is one academic year, at 750 rupiahs per month, plus 2,000 rupiahs for clothing and books.

Colombo Plan scholarships are available to graduate nationals of Colombo Plan member countries for study in Indonesia. Awards cover maintenance, tuition, travel, etc.

Iran

Learned societies, professional institutions and other associations

Iranian Astronautical Society, c/o Institute of Geophysics, Amirabad, Teheran. Belongs to IAF.

Government or official research establishments

Institute of Geophysics of the University of Teheran, Amirabad, Teheran. Has the following research laboratories and observatories engaged in space activities:

The Solar Physics Observatory, equipped with a 150 mm Coude refractor and an H alpha filter, for study of solar phenomena; related activities are the daily sketching of sun-spots, filtergrams of the solar disc and observations of prominences and flares;

The Ionospheric Observatory is equipped with a PIR-7C ionosonde;

The Air Glow Laboratory which has recently been equipped and where experimental work is in progress.

Laboratories in preparation are those for cosmic rays, in which the 18 unit neutron monitors were installed in October 1966, for zodiacal light, due to start in March 1967, and for ozone measurement, due to start in January 1968. In addition, the institute has laboratories or observatories for the following: geomagnetism,

[21] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

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tidal studies, gravity studies, seismology (with six observatories in various parts of the country), earth currents, atmospheric potential measurements and conductivity of the air. The institute co-operates in the running of the Satellite Tracking Station at Shiraz.

Satellite Tracking Station, Shiraz. A co-operative programme has been arranged between the Institute of Geophysics of the University of Teheran and the Smithsonian Astrophysical Observatory of the United States of America.

Universities and colleges

State University of Teheran, Avenue Shah-Reza, Teheran. Faculty of Science offers geophysics, cosmography, and astronomy. Affiliated to the university are the Institute of Geophysics and the Satellite Tracking Station.

The Ministry of National Education, under the United Nations programme, offers scholarships to nationals of Non-Self-Governing Territories, and of territories administered by Portugal, to enable them to study in Iran in fields including science and technology. Tenure is up to four years.

Iraq

Government departments and official agencies

Meteorological Organization, Baghdad Airport.

Universities and colleges

Department of Missions, Arab Section, offers approximately 400 scholarships for study in schools and colleges in Iraq to students from Aden, Algeria, Bahrain, Hadhramant, Indonesia, Iran, Jordan, Lahaj, Libya, Morocco, Muscat and Oman, Qatar, Sudan, Tunisia, the United Arab Republic and Yemen, and to Palestine refugees. Candidates must be recommended by their Governments or by recognized organizations in their countries. Duration varies according to study requirements ; awards cover cost of maintenance, tuition and books.

For information on awards available to nationals of Iraq for study in other countries, see the UNESCO publication, *Study Abroad*.[22]

Al-Hikma University of Baghdad, Box 2125, Baghdad, offers regular four-year courses leading to B.Sc. degree. Includes Departments of Mathematics and Physics.

University of Baghdad, Baghdad. This is a State university providing free education. Its College of Sciences includes Faculties of Physics and Mathematics.

[22] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Ireland

National and State academies

Royal Irish Academy, 19 Dawson Street, Dublin 2. Senior visiting fellowships, covering travel and a *per diem* allowance, are available to enable senior scientists from Ireland to study abroad, and reciprocally to enable Irish institutions to invite specialists from other countries to advise on new techniques or developments.

Learned societies, professional institutions and other associations

Engineering and Scientific Association of Ireland, 12 Lower Mount Street, Dublin.

Irish Astronomical Society, 26 Thornhill Road, Mount Merrion, County Dublin.

Government or official research establishments

Dunsink Observatory, County Dublin. Co-operates with the Armagh Observatory of Northern Ireland and the Boyden Observatory of Bloemfontein, South Africa.

Universities and colleges

Dublin Institute for Advanced Studies, 9-10 Burlington Road, Dublin 4. Includes Schools of Theoretical and Cosmic Physics. Scholarships in these fields are available to nationals of all countries with honours degrees and capability for research. Tenure is one year (renewable), at £500 to £700 per annum.

National University of Ireland, 49 Merrion Square, Dublin. Comprises the following three colleges :

University College, Earlsfort Terrace, Dublin ; Faculty of Science offers mathematics, physics, geophysics and electron physics ; Faculty of Engineering offers electrical engineering and electronics ;

University College, Cork ; Faculty of Science offers mathematics, physics and spectroscopy ; Faculty of Engineering offers electrical engineering and electronics ;

University College, Galway ; Faculty of Science offers mathematics and physics.

University of Dublin, Trinity College, Dublin 2. School of Natural Sciences offers mathematics, physics, chemistry and geophysics. Imperial Chemical Industries fellowships are available to students from any country for advanced study in fields including chemistry, physics and engineering. Candidates must possess a Ph.D. or equivalent degree. Tenure is one year, renewable up to three years, at £1,000 to £1,300, plus marriage and family allowances.

The Department of Education, Marlborough Street, Dublin 1, offers Government of Ireland scholarships reciprocally to students from the Federal Republic of Germany, Finland, France, Iceland, Italy, Norway and Switzerland, for study in Ireland for one academic year.

For information on fellowships and study grants for

nationals of Ireland to study in other countries, see the UNESCO publication, *Study Abroad.*[23]

Israel

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Meteorological Service of the Ministry of Transport and Communications, Bet Dagan, P.O. Box 25. Divisions include aerology, climatology, observation, research and training.

National Council for Research and Development, Building No. 3, Hakirya, Jerusalem. Engages in formulation of national policy for research and development and operation of research laboratories involving space subjects.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Israel Astronautical Society, c/o Department of Aeronautical Engineering, Technion-Israel Institute of Technology, Technion City, Haifa. Activities include observations of the satellites and a moon-watch station.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

National Physical Laboratory of Israel, Danziger Building, Hebrew University Campus, Jerusalem. Engages in applied research in the physical sciences, including energy conversion, small power units, the harnessing of solar energy and selective surfaces for satellites.

UNIVERSITIES AND COLLEGES

Ministry of Foreign Affairs, Department for International Co-operation, Jerusalem, offers scholarships primarily to nationals of developing countries to enable trainees or graduates with a knowledge of English, French or Spanish to undertake study, training or research in Israel. Awards cover maintenance and tuition, plus some spending money.

Ministry of Education and Culture, Jerusalem, offers scholarships for postgraduate study and research in Israel to graduate nationals of all countries with a knowledge of Hebrew or English. Tenure is one academic year, renewable, at I £ 400[24] per month, plus tuition.

For information on fellowships and studentships available to nationals of Israel, or to students at universities in Israel, see the UNESCO publication, *Study Abroad.*[25]

Bar-Ilan University, Ramat-Gan. Offers a wide programme of basic sciences. Scholarships for one year (renewable) are available to nationals of all countries, age 18 to 25, who are high school graduates and have Jewish religious orientation.

Hebrew University, Jerusalem. Offers mathematics, theoretical physics (spectroscopy, atomic processes in astrophysics, stability of stars, electrodynamics, special relativity), experimental physics (nuclear spectroscopy, plasma physics, shock tubes, lasers), meteorology (magnetohydrodynamics, dynamic meteorology, physical meteorology, physics of the upper atmosphere, physics of interplanetary space), chemistry (chemical reactions in shock tubes). Includes medical and other schools.

A Klausner Trust Fund scholarship, of $1,500 for one academic year, is open to a Canadian student.

Abraham Mazer scholarships of $1,000 for one academic year are open to nationals of the United States of America who are graduates of Yeshivah University, New York.

A Hirsch and Olga Taft exchange scholarship of $A1,100[26] for one academic year is available to an Australian student of Melbourne University.

Student Union exchange scholarships are available to Swedish students at Lund University. Duration is one month, the award covering maintenance and travel in Israel.

The Radio-isotope Training Centre offers regular courses and an international advanced course on the effects of radiation on advanced biological systems.

Technion-Israel Institute of Technology, Kiryat Hatechnion, Haifa. This college of university status offers undergraduate courses for the bachelor's degree and research facilities in graduate schools leading to the degrees of master and doctor of science. Department of Aeronautical Engineering offers navigation and guidance, dynamics of gases of the upper atmosphere, magnetofluid-dynamics, thermal effects in structures, systems and human engineering. The laboratories include shock tubes. There is a Department of Mathematics. The Department of Physics offers gravitational waves, physics of the sun and upper atmosphere, physics of the ionosphere and cosmic radiation. The laboratories include an ionosphere vertical recorder, spectroheliographs and solar telescopes.

Moonwatch — an optical tracking facility — has been set up and is associated with the Smithsonian Institute, United States of America.

Fellowships are offered by the Swope Foundation to nationals of all countries for study in science, technology, architecture and statistics. Tenure is one academic year at I£3,664 to I£4,208 for students for the master's degree and I£4,577 to I£5,127 for students for the doctor's degree.

Tel-Aviv University, 155 Herzl Street, Tel-Aviv. Offers a wide programme of basic sciences.

Weizmann Institute of Science, P.O. Box 26, Rehovoth. A research centre in the fundamental exact sciences, with some applied research. The graduate school offers courses towards the M.Sc. and Ph.D. degrees. Facilities include applied mathematics (terrestrial spectroscopy, theoretical seismology) ; computing centre ; biochemistry ; biophysics ; electronics ; infra-red

[23] *Ibid.*

[24] Israeli pounds.

[25] UNESCO, *Study Abroad, 1966-1968,* Paris, 1966.

[26] Australian dollars.

spectroscopy ; isotope research ; nuclear physics (experimental nuclear structure, high-energy physics) ; and photochemistry.

Post-doctoral fellowships in all fields of research in which the institute is engaged are available to nationals of all countries. Junior post-doctoral fellowships are open to candidates with Ph.D. or equivalent research experience. Senior post-doctoral fellowships (John F. Kennedy memorial fellowships and Chaim Weizmann memorial fellowships) are open to candidates with at least two years' post-doctoral or equivalent research experience. Duration is usually twelve months at I£8,400 annually for junior and I£9,600 for senior fellowships.

Awards available to students from the United States of America include three fellowships for students with M.Sc. or equivalent, to work for Ph.D., and one award for a student with B.Sc. to work for M.Sc. in applied mathematics, physics or physical chemistry.

Italy

National and State academies

Lincei National Academy, Palazzo Corsini, Via della Lungara 10, Rome. Includes sections for mathematics, mechanics, astronomy, geophysics, physics and chemistry.

Academy of Sciences, via Accademia delle Scienze 6, via Maria Vittoria 3, Torino.

Ferrara Academy of Sciences, via Savonarola 9, Ferrara.

Government departments and official agencies

National Commission for Nuclear Energy, via Crati 15, Rome. Conducts studies, research and experiment in nuclear physics and its applications ; engages in international collaboration.

National Research Council, Piazzale delle Scienze 7, Rome. Engages in the promotion and co-ordination of scientific research, making grants-in-aid to scientific institutes or to individual research workers, and advising the Government on scientific and technical matters. Divisions include mathematics, physics, chemistry, engineering and technology.

Commission for Space Research, Scuola d'Ingegneria Aerospaziale, via Eudossiana 18, Rome. Responsible for the San Marco co-operative space programme.

Commission for Automation.

Italian Commission of the International Geophysics Committee.

Working groups include astronomy and theoretical astrophysics, ELDO, participation of Italian industry in space activities, San Marco project.

Research centres include the following :

National Centre for Atmospheric Physics and Meteorology, Piazza L. Sturzo 31, Rome. Conducts theoretical studies and experimental research in atmospheric physics and meteorology ; organizes training and specialist courses ;

Centres of Electronics and Telecommunications Studies at the Milan Polytechnic, the Turin Polytechnic, the University of Bologna, the University of Rome, the University of Pisa and the University of Padua ;

Research fellowships in Italy are offered reciprocally to nationals of Brazil, France and the Netherlands.

Inspectorate of Telecommunications and Flight Aids, Viale Università 4, Rome. Includes divisions for radio, radar, navigation, meteorology, climatology and research.

Ministry of Scientific and Technological Research, Piazza della Minerva 38, Rome. Co-ordinates research activities.

Meteorological and Ecological Centre, Ministero di Agricoltura, via del Carovita 7a, Rome. Has observatories at Catania, Monte Rosa, Bari and Verona.

Learned societies, professional institutions and other associations

Italian Electrotechnical and Electronic Association, via S. Paolo 10, Milan.

Italian Geophysical Association, Piazzale delle Scienze 7, Rome.

Italian Association of Aerospace Medicine, via Piero Gobetti 2-A, Rome. Belongs to IAF.

Italian Rocket Association (AIR), via Nazionale 172, Rome. Formed for the promotion of research in rocket propulsion and astronautics. Belongs to IAF.

Italian Astronautical Science Association, via Borghesana Lucchese 24, Rome. Engages in study, research and publication in astronautical matters. Affiliated with the European Centre for Gravitational Research.

National Association of Nuclear Engineering, Piazza Sallustio 24, Rome.

Publicity Centre for Astronautical Science and Space Technology, via Costalunga 4, Trieste.

National Centre of Propulsion Technology and Materials, Istituto di Fisica Tecnica e Macchine Politecnico, Piazza Leonardo da Vinci 32, Milan.

Astronautics Study Centre, via Fregai 139, Modena.

Italian Thermotechnical Committee, Istituto di Fisica Tecnica, Politecnico, Turin.

Italian Rocket-modelling Commission ; sections at AIR, via Nazionale 172, Rome. Facoltà Ingegneria Napoli ; Politecnico, Milan. Engaged in control and co-ordination of study, trials and experiments by young rocket-modellers.

Italian Geophysical Institute, Casella Postale 3689, Milan.

Italian Institute of Space Law, via Giulia 251, Rome. Belongs to IAF ; represents Italy on the International Council of Space Law.

Italian Institute of Navigation, Piazzale Giulio Douhet 25, Rome.

National Institute of Nuclear Physics, Casella Postale 70, Frascati, Rome.

National Institute of Geophysics, Città Universitaria, Rome.

Italian Astronomical Society, via Brera 28, Milan.

Italian Physics Society, Istituto di Fisica, Università, via Irnerio 46, Bologna.

Western Geophysical Research, Piazza della Repubblica 32, Milan ; Largo Argentina 11, Rome ; via del Santurio 190, Pescara.

Foundations and trusts

Fondation Rui, via Virginio Orsini 21, Rome. Offers university studentships in Italy to nationals of all countries, especially in Latin America, Africa and Asia, aged 17 to 26. Duration is ten months, at $110 per month, plus maintenance and partial fees.

Government or official research establishments

Centre of Information, Study and Experiments, Casella Postale 3986, Milan. Supported partly by public bodies and partly by research contracts. Conducts basic and applied nuclear research in physics, chemistry, radio-chemistry, solid state physics, electronics, etc.

Aerospace Research Centre, Aeroporto dell'urbe, Via Salaria 851, Rome. The centre is a branch of the Institute of Aeronautical Structures of the School of Aerospace Engineering in Rome. It promotes theoretical and experimental research in aeronautical and space problems by computer and by modern experimental means of simulating high velocities and space environments, with electronic and mechanical engineering laboratories for the construction of scientific satellites and special instrumentation. The centre participates in the San Marco programme in collaboration with NASA.

Low-temperature Study Centre, Istituto di Fisica Tecnica della Università, via F. Marzolo 8, Padua.

Centre for Astrophysics Studies. Comprises four sections :

Astrophysical observatory of Arcetri, via S. Leonardo 75, Florence ;

Astrophysical observatory of Asiago ;

Astronomical observatory of Merate ;

Astrophysical observatory of Monte Porzio, Rome.

Fluid Dynamics Research Centre, Istituto di Meccanica Applicata alle Macchine del Politecnico, corso Duca degli Abruzzi 6, Turin.

Centre for Nuclear Studies at Ispra, via Cerva 31, Milan. Conducts research in physics, applied nuclear science and engineering, radiochemistry and biology ; and training of personnel.

Study and Research Centre for Aerospace Medicine, via Piero Gobetti 2A, Rome. Conducts experimental research in physiology and psychology of man in flight in the atmosphere and in space ; also educational and cultural activities in the field of aerospace medicine.

Space Research Institute, via Serchio 9, Rome. Attached to National Research Council. Serves as a centre for study and research and of co-ordination of fundamental scientific research and space applications. Contributes to education and postgraduate training of scientific and technical personnel.

Ionized Gas Laboratory, Casella Postale 65, Frascati, Rome. Conducts experimental and theoretical research on plasma physics.

Astronomical Observatory of Capodimonte, Naples.

Astronomical Observatory, Padua.

Astronomical Observatory of Rome, su Monte Mario, Rome. Includes an astronomical museum and associated astronomical stations of the Grande Sasso and Monte Porzio.

Astronomical Observatory, via Tiepolo 11, Trieste.

Experimental Geophysics Observatory, viale R. Gessi 4, Trieste.

Observatory for Scientific Experiments in Aeronautical Meteorology, Monte Cimone (Sestola), Vigna di Valle, Messina, Cagliari.

Industrial or commercial research organizations

Consorzio Industrie Associate, via Torino 44, Rome. Concerned with research and development in space activities, particularly in the ELDO programme.

Universities and colleges

Italian government scholarships are offered by the Ministry of Foreign Affairs, Palazzo Farnesina, Rome, to nationals of all countries, but preferably developing countries, for academic study or research in Italy. Tenure is eight months (renewable) at 80,000 lire per month, plus certain allowances.

Bursaries are offered to nationals of all countries to enable technicians and artisans to obtain practical or specialized training in industrial enterprises. Tenure is variable, at 80,000 lire per month, plus certain expenses.

For information on fellowships, studentships and grants for Italian nationals or students at Italian universities to study in other countries, see the UNESCO publication, *Study Abroad*.[27]

Istituto Superiore PP.TT., viale Trastevere 189, Rome.

Milan Polytechnic, Piazza Leonardo da Vinci 32, Milan. Offers mathematics, physics, atomic physics, electrotechnics, nuclear engineering and siderurgy ; Institute of Aeronautics offers aerodynamics, gas dynamics and propulsion.

Turin Polytechnic, Corso Duca Degli Abruzzi, Turin. Offers nuclear technology, electromagnetic fields, electrotechnics and electronics ; the School of Aeronautical and Space Engineering offers two-year courses including aerodynamics, gas dynamics, propulsion, guidance and navigation, instrumentation, fluid physics and space vehicle dynamics. The Fiat Automobile Company offers two scholarships to students from the United States of America to pursue advanced studies in aeronautics and automobile technology at the Polytechnic. Tenure is eight months and awards cover maintenance, fees, books, etc.

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[27] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Scuola di Applicazione dei Carabinieri, via Garibaldi, Rome. Offers regular university level courses in space law.

School of Aerial Warfare, Florence, offers regular university-level courses in space law.

Pisa State University College, Piazza dei Cavalieri 7, Pisa. Offers mathematics, physics, chemistry, spectroscopy, electronics, biophysics, relativity. An exchange scholarship for eight months, giving free maintenance and tuition, plus certain allowances, is available to a national of the United Kingdom.

Scuola de Stato Maggiore, Civitavecchia, Rome. Offers regular university-level courses in space law.

University of Bologna, via Zamboni 33, Bologna. Faculty of Mathematics, Physics and Natural Sciences offers nuclear physics, molecular spectroscopy and mechanics; Faculty of Engineering offers electronics and electrotechnics.

University of Catania, Catania. Faculty of Mathematics, Physics, Chemistry and Natural Sciences offers astronomy.

University of Florence, Piazza San Marco 4, Florence. Faculty of Science offers mathematics, physics, electromagnetic waves, mechanics and astronomy.

University of Genoa, Genoa. Faculty of Mathematics, Physics and Natural Science offers solid state physics and geodesy; Faculty of Engineering offers mechanics, electrotechnics, electromagnetic fields, siderurgy, aerodynamics and aerospace propulsion. Exchange studentships are offered to students from Belgium, the Federal Republic of Germany, France and Switzerland with a good knowledge of Italian. Tenure is one year covering maintenance, fees, travel and spending money.

University of Milan, via Festa del Perdono 7, Milan. Faculty of Sciences offers mathematics, physics, radioactivity and astronomy.

Naples University, Corso Umberto 1, Naples. Faculty of Science offers mathematics, physics, nuclear physics, mechanics, molecular spectroscopy and astronomy; Faculty of Engineering offers mechanics of vibration, applied electronics, applied thermodynamics, and electrotechnology; Institute of Aerodynamics offers hypersonics, gas dynamics, aeronomy, meteorology, missile ballistics, cybernetics, space vehicle construction, servomechanisms, rockets and space propulsion.

University of Padua, via VIII Febbraio 9, Padua. Faculties of Science and Engineering offer astronomy, molecular spectroscopy, physics, mechanics, nuclear physics, thermodynamics, electronics and electrotechnics.

University of Pavia, Corso Strada Nuova 65, Pavia. Faculty of Science offers mathematics and physics. Exchange studentships are offered to nationals of the Federal Republic of Germany, France, Switzerland, the United Kingdom and the United States of America for university studies or postgraduate courses. Tenure is one academic year, covering maintenance, fees, travel and spending money.

University of Perugia, Piazza dell'Università, Perugia. Faculty of Mathematical, Physical and Natural Sciences offers geophysics and climatology.

University of Pisa, Lungarno Pacinotti 43, Pisa. Faculty of Mathematical, Physical and Natural Sciences offers spectroscopy; Faculty of Engineering offers electrotechnology; Aeronautics Section offers aerodynamics, gas dynamics, space vehicles and aerospace guidance systems.

University of Rome, Città Universitaria, Rome. Faculty of Mathematics, Physics and Natural Sciences offers astronomy, astrophysics and terrestrial physics. Faculty of Engineering offers applied electronics and telecommunications. School of Aerospace Engineering, via Eudossiana 16, Rome, offers two-year graduate courses in either aerospace vehicles (aerodynamics, space flight mechanics, electronics and radio communications, propulsion, space physics, aerology, aerospace law, politics and economics of aerospace travel, aerospace biology, instrumentation and servomechanisms, guidance, control and stability, telemetry), or astronautics (mechanics of space flight, aerodynamics, electronics, radio communications, propulsion, space physics, aerospace law, aerology, politics and economics of aerospace travel, aerospace biology, astrodynamics and dynamics of ionized and rarified fluids). The Specialist School of Aerospace Medicine, Istituto di Farmacologia Medica, facoltà di medicina e chirurgia, offers a two-year specialized course.

University of Turin, via G. Verdi, 8-Via Po 17, Turin. Faculty of Mathematical, Physical and Natural Science offers mechanics, biophysics, electronics, neutron physics, astronomy, radioactivity, electrochemistry, nuclear physics and spectroscopy.

Trieste University, Piazzale Europa 1, Trieste. Faculty of Mathematics, Physics and Natural Sciences offers astronomy. Faculty of Engineering offers electrotechnology, electronics and electromagnetic field studies.

Ivory Coast

Government or official research establishments

Station géophysique de Lamto [Lamto Geophysical Station], B.P. 398, Abidjan. Conducts seismological and climatological studies.

Universities and colleges

Abidjan University. Faculty of Sciences offers physics and mathematics.

Jamaica

Universities and colleges

University of the West Indies, Mona, Kingston 7. Faculty of Natural Sciences offers mathematics and physics. Courses are offered to prepare specialists for scientific experiments conducted by the university in the study of the ionosphere, including ionospheric sounding to measure the electron density profile to about 400 km

height, observation of satellite signals providing information on ionospheric parameters and observation of drift motion at 100-200 km height.

Scholarships for study at the university include the Alcan Jamaica Independence scholarship of £600 maximum per year for two years, open to a graduate from any country, the Alcan Jamaica Independence junior research fellowship for one year in the first instance, at £750 maximum per year, open to a West Indian graduate, and Old Dominion Foundation scholarships of £425 plus tuition and examination fees, for two years in the first instance, open to students from the West Indies.

The Ministry of Education, Kingston, offers awards under the Commonwealth Scholarship and Fellowship Plan, for postgraduate study and research in any Faculty of the University of the West Indies, available to graduates of a Commonwealth country other than Jamaica ; age normally under 35 years. Tenure is one academic year, and awards cover maintenance, tuition and travel.

For information on fellowships and study grants available to nationals of Jamaica for study or research in other countries, see the UNESCO publication *Study Abroad*.[28]

Japan

National and State academies

Japanese Academy, Ueno Park, Tokyo. Subjects represented include astronomy, geophysics, geo-electricity, geomagnetism, physics and mathematics.

Government departments and official agencies

Japanese Meteorological Agency, 1-7 Ote-machi, Chiyoda-ku, Tokyo.

Science Council of Japan, Ueno Park, Tokyo. This is the government agency for the promotion of scientific development throughout national life, industry and administration ; co-ordinating scientific research and linking with scientific organizations in other countries. Its sections include pure science and engineering.

National Space Activities Council, c/o Aeronautics and Space Section, Research Co-ordination Bureau, Science and Technology Agency, 4, 3-chome, Kasumigaseki, Chiyodaku, Tokyo. Includes panels for space activities, space science and space technology. Effects liaison between government agencies in space administration, peaceful uses of space and space science and technology.

Learned societies, professional institutions and other associations

Ikomasan Astronomical Society, Ikoma-Sanzyo, Ikoma-gun Nara Ken.

Oceanographical and Meteorological Society, 7-chome, Ikutaku, Kobe.

Japanese Society for Aeronautical and Space Sciences, Hikokan 3, 1-chome, Shiba Tamura-cho, Minato-ku, Tokyo.

Air Law Institute of Japan, No. 9, 3-chome, Kanda-Surugadai, Chiyoda-ku, Tokyo.

Japanese Aerospace Medical and Psychological Society, Department of Physiology, Tokyo Jikei-kai University School of Medicine, No. 105, 2-chome, Shiba-Atogo-cho, Minato-ku, Tokyo.

Japanese Rocket Society, c/o Institute of Industrial Sciences, University of Tokyo, No. 1, Yayoi-cho, Chiba City ; Tokyo office, c/o Yomiuri Shinbun 1-3, Ginza-Nishi, Chuo-ku, Tokyo. Belongs to IAF.

Japanese Astronautical Society, No. 92, 2-chome, Nobuto, Chiba City. Belongs to IAF.

Meteorological Society of Japan, c/o Japanese Meteorological Agency, 1-7 Ote-machi, Chiyoda-ku, Tokyo.

Astronomical Society of Japan, Tokyo Astronomical Observatory, Mitaka, Tokyo.

Society for Cosmo-Physical Research, Miyake Building, 8 Nishi-8 Ginza, Chuo-ku, Tokyo.

Foundations and trusts

Yomiuri, 1-3 Ginza-Nishi, Chuo-ku, Tokyo, offers fellowships to French nationals who are research workers of proven ability, in exchange for similar facilities offered to Japanese research workers by the Centre national de la recherche scientifique, Paris. Duration is up to a total of thirty man-months per year, at 186,000 to 225,000 yen per month.

Government or official research establishments

KDD Ibaraki Space Communications Centre, Juo-machi, Toga-gun, Ibaraki Prefecture. This is not an educational or training institute and does not offer systematic courses, but accepts a limited number of trainees for work on satellite communications. At present there is no appropriate hotel or lodging accommodation near this centre.

National Science Museum, Ueno Park, Daitô-ku, Tokyo. Includes exhibitions in physics, engineering and astronomy.

National Aerospace Laboratory, No. 1, 880 Jindaiji-Machi Chofu Tokyo, Tokyo Musashino (4) 9171. Divisions include aerodynamics, propulsion, rocket propulsion, instrumentation and flight research.

Aerological Observatory, meteorological agency, Tateno, Yatabe-machi, Tsukuba-gun, Ibaraki Prefecture. Conducts meteorological observations at high altitude.

Radio research laboratories of the Ministry of Posts and Telecommunications, Kaganei-shi, Tokyo. This is not an educational or training institute and does not offer systematic courses, but accepts a limited number of trainees for work on satellite communications.

[28] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Tokyo Astronomical Observatory, University of Tokyo, 998 Osawa, Mitaka-shi, Tokyo.

Institute of Space and Aeronautical Science, c/o University of Tokyo, No. 856, Komaba, Meguro-ku Tokyo. Concerned with advanced rocket technology and space science research programmes in general; telemetry, propulsion, avionics, aerodynamics, aeronautical science, etc. Stations include:

The Michikawa rocket range;

The Noshiro rocket test centre, No. 1, Nishiyama, Shimo Assauchi, Noshiro-shi, Akita Prefecture;

The Kagoshima Space Centre, Nagatsubo. Minamigata, Uchi-nonra-machi Kimotsuki-gun, Kagoshima Prefecture.

Cosmic-ray Laboratory, Mt. Norikura, Nyukawamura, Ono-gun, Gifu-ken; part of the Institute for Nuclear Study of the University of Tokyo.

Industrial or commercial research organizations

Guided Missile Association, 405 Eiraku Building, 1-2 Marunouchi, Chiyodaku, Tokyo; an association of fifty member companies.

Universities and colleges

Japanese universities and colleges offer many courses of basic subjects directly or indirectly related to space science and technology. The first eight listed below are the national universities which usually accept foreign students and research workers on the Japanese Ministry of Education scholarships.

Hokkaido University, Nishi 5, Kita 8, Sapporo-shi, Hokkaido. Faculty of Science offers mathematics, physics and spectroscopy. Department of Geophysics offers geophysics, geodesy and meteorology. Faculty of Engineering, Department of Electronics offers electronics in general.

Tohoku University, Katahiracho, Sendai-shi, Miyagi Prefecture. Faculty of Science, Department of Physics, offers nuclear physics, electromagnetics, spectrology, semiconductor physics and radiophysics. Departments of Astronomy and Geophysics offer astronomy, astrodynamics, astrophysics, astrometry, geomagnetics, geodesy and meteorology. Faculty of Engineering, Department of Telecommunications, offers telecommunications engineering. Department of Electronics offers gas electronics, vacuum electronics, solid electronics and electrophysics.

University of Tokyo, Hongo, Bunkyo-Ku, Tokyo. Faculty of Science offers mathematics, physics, dynamics, electromagnetics, optics, nuclear physics, plasma physics, astronomy, astrophysics, meteorology, geophysics, geodesy, geomagnetism, planetary physics, seismology, upper atmosphere physics and solar physics. Faculty of Engineering offers electronics, transmission, telemetry, aerodynamics, hypersonics, structures and rocket technology. Institute of Industrial Science offers space electronics and upper atmosphere physics. Associated institutes separately listed are the Tokyo Astronomical Observatory, the Institute of Space and Aeronautical Science, and the Institute of Nuclear Study.

Tokyo Institute of Technology, 1, O-Okayama, Meguro-ku, Tokyo. Faculty of Science and Engineering offers mathematics, chemistry and physics. Departments of Electrical Engineering and Electronics offer telecommunications and electronics in general. Fellowships (15) are offered by the Government of Japan under a UNESCO programme to students from all countries for participation in an international postgraduate course in chemistry and chemical engineering; tenure is one year, and the grant 54,000 yen per month, plus certain other allowances.

Nagoya University, Furo-cho, Chikuse-ku, Nagoya. Faculty of Science, Department of Physics, offers optics, space physics, nuclear physics, plasma physics, electromagnetics, and cosmic ray physics. Department of Terrestrial Science offers geochemistry, geophysics and geodesy. Faculty of Engineering offers propulsion. Department of Electrical Engineering offers telecommunications and electromagnetic waves. Department of Electronics offers electronics in general. Associated institutes are the Research Institute of Atmospherics, offering atmospheric physics and radioastronomy; the Research Institute of Environmental Medicine, offering aerospace medicine and the Institute of Plasma Physics.

Kyoto University, Yoshida-Hommachi, Sakyo-ku, Kyoto. Faculty of Science, Department of Physics, offers radiospectrology, plasma physics, nuclear physics, high energy physics, cosmic rays, cosmophysics. Department of Space Physics offers astrophysics, astrometry, astronomy. Department of Geophysics offers meteorology, geophysics, geomagnetics, geodesy. Faculty of Engineering offers aerospace propulsion, aeronomy and space physics. Department of Electrical Engineering offers telecommunications. Department of Electronics offers electronic measurement, electron physics. Associated institutes are the Kwasan Astronomical Observatory, the Research Institute for Fundamental Physics and the Research Institute for Mathematical Science.

Osaka University, 36 Joancho, Kita-ku, Osaka. Faculty of Science offers physics, mathematics, nuclear science, atomic physics and quantum physics. Faculty of Engineering offers telecommunications.

Kyushu University, Hakozaki, Fukuoka-shi, Fukuoka Prefecture. Department of Physics offers physics, mathematics, dynamics, spectrology, geophysics, atmospheric physics. Faculty of Engineering offers telecommunications.

Chiba University, 1 Yayoicho, Chiba City. Faculty of Arts and Science offers mathematics and physics.

Gunma University, 3 Showa-machi, Maebashi. Faculty of General Study offers mathematics and physics.

Hirosaki University, 1 Bunkyo-cho, Aomori-ken, Hirosaki. Faculty of Science offers nuclear physics and quantum theory.

Hiroshima University, Higashisenda-machi, Hiroshima. Includes a Research Institute for Theoretical Physics.

Kagoshima University, Uerata-cho, Kagoshima. Faculty of Science offers mathematics and physics.

Kobe University, Rokko, Nada-ku, Kobe. Faculty of Science offers mathematics and physics. Faculty of Engineering offers instrumentation.

University of Tokushima, 6 Shinkura-cho, 2-chome, Tokushima-shi, Tokushima-ken. Faculty of Engineering offers mathematics, physics, electronics and communications.

Waseda University, Totsuka-cho, Shinjuka-ku, Tokyo. This is a private university offering day and evening courses; School of Science and Engineering offers mathematics, physics, electronics and communications.

There are no special scholarships or fellowships for the study of space science and technology in Japan, but the general scholarships offered by the Japanese Ministry of Education are available to foreign students and research workers who wish to study or do research on various subjects related to space science and technology at national universities in Japan. Applicants, male or female, must be nationals or citizens of countries to which the scholarships are allocated by the Ministry, and must be willing to study the Japanese language in order to study at universities where the language of instruction is Japanese. Applicants for undergraduate students' scholarships must be between 18 and 22 years of age at admission into the Japanese university, must have completed more than twelve years of education, exclusive of nusery or kindergarten school, and must be eligible for admission to universities of their own countries. The tenure of undergraduate scholarships is five years. Applicants for research students' scholarships must be under 35 years of age at admission into the Japanese university and must be university or college graduates at the time of admission. These scholarships are tenable for either two years from April or one and one-half years from October, as the applicant chooses. Further information on these two scholarships is obtainable from Japanese embassies in most countries.

Ministry of Education, 4 Kasumigaseki, 3-chome, Chiyoda-ku, Tokyo, offers foreign scholarship grants for general subjects, tenable in Japan. For African, American, Asian and European graduates, two-year scholarships are offered at 50,000 yen per month, plus travel, tuition and other fees. For Asian nationals having completed twelve years of education, a duration of five years is possible, the first three being devoted to instruction in Japanese language, culture and basic subjects.

Bursaries in general science and technology subjects are offered by the Science and Technology Agency, Prime Minister's Office, 4 Kasumigaseki, 3-chome, Chiyoda-ku, Tokyo. International awards (2) open to nationals of Asian countries who have two years' research experience in nuclear energy are tenable at government research institutes in Japan for six months, covering maintenance and travel. International awards (4) open to nationals of Australia, the Federal Republic of Germany, France, the Netherlands and the United States of America who have three years' postgraduate experience in science or technology, are for ten to twelve months at 45,000 to 70,000 yen per month, plus travel.

Asia Kyokai, Society for Economic Co-operation in Asia, 37 Akasaka-Shinsakamachi, Minato-ku, Tokyo, offers scholarships under the Colombo Plan for technical training in fields including chemical industries and atomic energy to nationals of countries in South and South-East Asia, the Middle East and Africa, who are English- or Japanese-speaking graduates. Awards are tenable in Japan, for six months (renewable) at 1,200 to 2,000 yen per day, plus travel and certain other expenses.

Kenya

Government departments and official agencies

East African Meteorological Department, P.O. Box 30259, Nairobi. Includes research on artificial stimulation of rain.

Regional Centre for Science and Technology for Africa, Nairobi. Assists member States of the Lagos Plan to implement the needed fifteenfold increase in the number of scientists in Africa; holds conferences, seminars, symposia and courses under the auspices of UNESCO.

Universities and colleges

Regional Meteorological Training Centre, Nairobi. Established by the Governments of Kenya, Uganda and the United Republic of Tanzania, through the East African Common Service Organization and with the assistance of the World Meteorological Service, for the training of junior and assistant meteorologists of the English-speaking countries of Africa. The course is of two years' duration, the first half corresponding to assistant meteorologist and the second to junior meteorologist training. Candidates must have a GCE "O" level certificate or equivalent, and must have completed meteorology observer training through national training facilities.

University College, Nairobi. Faculties of Science and Engineering offer mathematics, physics, chemistry and meteorology. A chair of meteorology was established and has functioned with the assistance of WMO for the training of senior meteorologists of the English-speaking countries of Africa. The course, which is at the postgraduate level, is of nine months' duration.

The Ministry of Education, Gill House, P.O. Box 30040, Nairobi, under the Commonwealth Plan, offers two scholarships to Commonwealth graduates, normally aged 22 to 28 years, for advanced study or research at one of the constituent colleges of the University of East Africa. Tenure is normally two academic years, and awards cover travel, tuition, maintenance (£600 per annum) and certain other allowances.

For information on scholarships and study grants for residents of Kenya for study in other countries, see the UNESCO publication, *Study Abroad*.[29]

[29] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Lebanon

Government departments and official agencies

Service météorologique, Beirut International Airport. Includes a Climatology Centre and a Centre of Observatory Stations and Radio-sondage.

Learned societies, professional institutions and other associations

Lebanese Rocket Society, Haigazian College, P.O. Box 1748, rue de Mexique, Beirut.

Government or official research establishments

Centre d'études et de recherches mathématiques et physiques [Study and Research Centre for Mathematics and Physics], rue de Damas, B.P. 3855, Beirut.

Universities and colleges

For information on government grants to Lebanese students for advanced studies in other countries, see the UNESCO publication, *Study Abroad.* [30]

Université saint Joseph, B.P. 293, Beirut. Higher School of Engineering offers physics and mathematics. Ksara Observatory offers astronomy, seismology, magnetics and meteorology. The observatory library contains 8,000 volumes.

Madagascar

Government or official research establishments

Station de repérage [Satellite Spotting Station], near Tananarive; a station for satellite tracking established by the United States of America.

Malaysia

Government departments and official agencies

Malaysian Meteorological Services, Kuala Lumpur Airport.

Learned societies, professional institutions and other associations

Malayan Scientific Association, c/o Institute for Medical Research, Pahang Road, Kuala Lumpur.

Universities and colleges

University of Malaya, Pantai Valley, Kuala Lumpur. Faculties of Science and Engineering offer physics and mathematics.

Ministry of Education, Rumah Persekutuan, Kuala Lumpur, administers Commonwealth scholarships offered by the Government of Malaysia, under the Commonwealth Scholarship and Fellowship Plan, to Commonwealth citizens. Awards are for postgraduate study in Malaysia, normally for two academic years at $M6,000 per year plus travel.

For fellowships and study grants available to nationals of Malaysia for study in other countries, see the UNESCO publication, *Study Abroad.* [31]

Malta

Universities and colleges

Royal University of Malta, St. Paul Street, Valetta. Includes Faculties of Science and Engineering. The observatory has full meteorological equipment.

Education Office, 141 St. Christopher Street, Valetta, offers awards under the Commonwealth Scholarship and Fellowship Plan, to Commonwealth citizens for undergraduate study in mechanical or electrical engineering, age normally 17 to 25. Tenure is two academic years (renewable), at £500 per year, plus tuition and travel allowances.

Mexico

National and State academies

Academia Nacional de Ciencias [National Academy of Sciences], Justo Sierra 19, Mexico City.

Ateneo Nacional de Ciencias y Artes de Mexico [National Athenaeum of Science and Arts]. Sections include astronomy and mathematics, science and engineering.

Government departments and official agencies

Dirección de Geografía y Meteorología [Geographical and Meteorological Department], Avda. Observatorio 192, Tacubaya, Mexico. Office of Meteorology includes a special studies group on meteorology and climatology.

Mexican National Commission on Outer Space. This commission of the Secretariat of Communications and Transport conducts meteorological soundings in co-operation with NASA.

Learned societies, professional institutions and other associations

Sociedad Astronómico de México [Mexican Astronomical Society], Jardín Felipe Xicotencatl, Colonia Alamos 13, A.P. 9647, Mexico 1, D.F.

Sociedad Mexicana de Estudios Interplanetarios [Mexican Society for Interplanetary Studies], Mexico 1, D.F. Belongs to IAF.

[30] UNESCO, *Study Abroad, 1966-1968,* Paris, 1966.

[31] *Ibid.*

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Astronomical Observation Station, Tonantzintla, Puebla. Functions under the National Astronomical Observatory.

Institute of Mathematics, Torre de Ciencias, Ciudad Universitaria, Mexico, D.F. Conducts research in mathematics.

National Astronomical Observatory, Ap. Postal 25264, Mexico 20, D.F. Attached to the Autonomous National University of Mexico.

UNIVERSITIES AND COLLEGES

Secretariat of Public Education, calles de Argentina y Luis González Obregón, México 1, D.P. Offers information on study grants to nationals of other countries who wish to study in Mexico.

Scholarships (2) of the Inter-American Convention for the Promotion of Cultural Exchange, for one year at 1,250 pesos monthly, plus fees and travel.

Scholarships (12) of the Mexico-United States of America Commission for Cultural Co-operation, for study at the University of Mexico or another institution of higher education. Preference is given to graduates. Tenure is ten months and awards cover matriculation fees plus 1,250 pesos monthly.

Scholarships of the Brazil-Mexico Cultural Exchange agreement are offered reciprocally to Brazilians for study in Mexico. Candidates may be professors, research scientists, students or other interested persons.

Secretariat of National Defence, Lomas de Sotelo, México, D.F., offers scholarships for study in engineering and other fields in Mexico to nationals of countries which maintain friendly relations with Mexico. Candidates should be graduates not over 28 years of age. Tenure is three to six years.

For information on scholarships available to Mexican nationals and to students at Mexican universities, see the UNESCO publication, *Study Abroad.* [32]

Colegio Nacional [National College], Luis González Obregón 23, Mexico 1, D.F., offers mathematics, physics and astronomy.

Monterrey Institute of Technology and Higher Education, Sucursal de Correos J, Monterrey, Nuevo León. Includes Departments of Mathematics, Physics, Chemistry, Engineering and Law. Scholarships (approximately 10) for study in fields including electricity, physics, mathematics, mechanics and chemistry are offered to nationals of any country, minimum age 17 years, having completed secondary education, and without sufficient financial means. Tenure is one year, at 2,000 pesos maximum.

Autonomous University of Guadalajara, Pavo 209, Guadalajara Jalisco. Includes Faculties of Engineering, Chemical Sciences, Law, Biological Sciences and Institute of Exact and Earth Sciences. Scholarships (200) of college expenses for one year, are awarded to university students of recognized academic merit, nationals of Mexico, the United States of America and other countries. Preference is given to those financially most necessitous.

Autonomous University of Puebla, Puebla. Includes Faculties of Physics and Mathematics, Medicine, Law, Chemical Engineering and Chemistry. Scholarships for continuation of studies are offered to foreign students directly and on an exchange basis.

Chihuahua University, Ciudad Universitaria, Chihuahua. Faculty of Engineering offers mathematics, physics and cosmography.

Guadalajara University, Avenida Juárez 975, Guadalajara, Jalisco. Affiliated institutes include Institute of Astronomy and Meteorology. Scholarships are offered to nationals of any country meeting the university academic requirements and not having sufficient financial means.

National Autonomous University of Mexico, Ciudad Universitaria, Villa Obregón, México 20, D.F. Includes Faculties of Science and Engineering; affiliated Research Institutes of Physics, Geophysics and Mathematics and an affiliated Astronomical Research Observatory. Scholarships are offered to nationals of any country, of half the college expenses, subject to results of previous study and the financial position of the candidate.

University of Nueva León, Monterrey, Nueva León. Includes Faculty of Mathematics and Physics. Affiliated institutes include the Institute of Scientific Research. Scholarships (3) are offered to nationals of any country, not over 35 years of age, with good records and well recommended. Tenure is one year, and the awards cover matriculation expenses.

University of Querétaro, Ave. 16 de Septiembre 65, Querétaro. Facilities include a Meteorological Institute and Observatory.

Monaco

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Centre scientifique de Monaco [Scientific Centre of Monaco] Villa Girasole, 16 Boulevard de Suisse, Monte Carlo. Research interests include meteorology.

Musée océanographique [Oceanographic Museum], avenue Saint-Martin, Monaco. The Oceanographic Institute of Paris offers four fellowships to qualified graduate oceanographers from any country, for physical or biological oceanographic research at the museum. Candidates should be over 25; tenure is one month at least, at 500 francs.

Mongolia

NATIONAL AND STATE ACADEMIES

Academy of Sciences of the Mongolian People's Republic, Ulan-Bator. Directs all scientific research

[32] *Ibid.*

work in Mongolia. Maintains a hydro-meteorological service, seismological stations, and an astronomical observatory. Took part in the International Geophysical Year.

Universities and colleges

Mongolian State University, Ulan-Bator. Faculty of Physics and Mathematics includes departments of physics, mathematics and meteorology.

Morocco

Learned societies, professional institutions and other associations

Société des sciences naturelles et physiques du Maroc [Moroccan Society of Natural Sciences and Physics], Institut scientifique chérifien, avenue Moulay-chérif, Rabat. While the society is devoted mainly to the study of natural sciences in Morocco, it has interests in physics and astronomy and, from time to time, publishes papers on these matters.

Government or official research establishments

Institut scientifique chérifien (ISC) [National Scientific Institute], avenue Moulay-chérif, Rabat. Affiliated to the Faculty of Sciences of the Mohammed V University. The Service de physique du globe [Terrestrial Physics Service] connected to ISC is in three parts: (*a*) seismology and terrestrial magnetism; (*b*) meteorology and climatology, associated with the air department of the Ministry of Public Works and Communications, and (*c*) ionosphere investigations, associated with the Ministry of Postal Services, Telegraphy and Telephones. The institute operates an observatory at Berrechid. Attached institutes include the seismology station at Ifrane and the Averroës seismological observatory at Berrechid.

Service de physique du globe et de météorologie [Service of Terrestrial Physics and Meteorology], 2 rue de Foucauld, Casablanca. Conducts research in meteorology, climatology, the atmosphere, the ionosphere, seismology and terrestrial magnetism.

Universities and colleges

Centre de formation du personnel de l'aviation civile et de la météorologie [Training Centre for Civil Aviation and Meteorological Personnel], P.O. Box 5119, Casablanca Maarif. WMO has been collaborating with ICAO in the meteorological programme at this centre. Courses are given for meteorological assistants and observers, generally beginning in September of each year. The duration of these courses is respectively twelve months and eight months for meteorological assistants and observers.

Mohammed V University, avenue Moulay-chérif, Rabat. Faculty of Sciences offers mathematics and physics. There is a university centre for scientific research.

The Ministry of National Education, Rabat, offers scholarships to nationals of all countries, aged 15 to 25, for advanced studies in Morocco; tenure is one academic year, renewable for the duration of the course, at 2,565 dirhams.

Netherlands

National and State academies

Royal Netherlands Academy of Sciences, Kloveniersburgwal 29 (Trippenhuis), Amsterdam. Includes a section for mathematics and natural sciences. The academy is responsible for the Netherlands Committee for Geophysics and Space Research.

Government departments and official agencies

Netherlands Committee for Geophysics and Space Research, Koninklijk Nederlands Meteorologisch Instituut, Utrechtseweg 297, De Bilt.

Learned societies, professional institutions and other associations

Netherlands Society of the Sciences, Spaarne 17, Haarlem. Organizes lectures on scientific subjects and awards annual prizes and subsidies for research and publications.

National Aeromedical Centre, Kampweg 3, Soesterberg.

Netherlands Association of Aviation Medicine, Kampweg 2, Soest.

Netherlands Astronautical Society, Willem Bilderdijkhof 69, Delft. Belongs to IAF.

Foundations and trusts

Netherlands Universities Foundation for International Co-operation, Molenstraat 27, The Hague. Promotes international co-operation in the fields of higher education and research by establishing and maintaining institutes and postgraduate international courses and by educational and scientific assistance to developing countries.

Study Fund for South African Students, Keizergracht 141, Amsterdam. Offers four bursaries to graduate nationals of South Africa for study in the Netherlands. Candidates should be between 20 and 30 years of age; tenure is one year, at £400.

University Refugee Fund, F.C. Dondersstraat 16, Utrecht. Offers scholarships to qualified refugee students, to enable them to finish higher studies in the Netherlands. Tenure is renewable from year to year, at 240 florins per month, plus other allowances.

Government or official research establishments

Koninklijk Nederlands Meteorologisch Instituut (Royal Netherlands Meteorological Institute), Utrechtseweg 297, De Bilt. Conducts studies in meteorology,

climatology, magnetism, geophysics and undertakes ionosphere research.

Space Research Laboratory, Huizingalaan 121, Utrecht (see entry on Utrecht Observatory below).

National Aerospace Laboratory, Sloterweg 145, Amsterdam 17. Primarily engaged in aerospace research in fluid dynamics, flight dynamics, structures and materials. An excellent review of Netherlands aerospace activities in general, and of the work of the laboratory in particular, is contained in the AGARD Information Bulletin, No. 66/3, November 1966. While there are research opportunities, no special courses are offered.

Utrecht Observatory, Zonnenburg, University of Utrecht, Zonnenburg 2, Utrecht. Conducts studies in solar physics, stellar atmospheres and stellar photometry, radio-astronomy and laboratory astrophysics. The Space Research Laboratory of Utrecht Observatory, at Huizingalaan 121, Utrecht, offers studies in ultra-violet and X-radiation of the sun, particle radiation of the sun, solar-terrestrial physics and X-radiation of celestial sources.

Scholarships and fellowships are offered in the fields of astrophysics, study of the sun, space research, stellar astrophysics, radio-astronomy and laboratory astrophysics, to graduate students or professional astronomers from all countries. Tenure varies from one month to one year, and awards cover the amount of the recipient's salary.

Industrial or commercial research organizations

Bull General Electric Computing Centre, Vliegtuigstraat 26, Amsterdam W. (scientific computing and programming in aviation and astronautics).

Universities and colleges

All universities and institutions of technology in the Netherlands have departments of mathematics and physics offering basic subjects related to the peaceful uses of outer space.

Catholic University of Nijmegen, Bijleveldsingel 70, Nijmegen. Faculty of Sciences (Driehuizerweg 200, Nijmegen) offers courses and practical instruction in astronomy.

Philips International Institute of Technological Studies, Eindhoven, offers studies including electronics. Study awards (30) are offered to male nationals of any country who are graduates in science or engineering and have a good knowledge of English; age under 30. Maximum tenure is one year, at 450 florins per month, plus free tuition.

State University of Groningen, Broerstraat 5, Groningen. Faculty of Science offers astronomy, astrophysics, photometry and space research. The affiliated Kapteyn Astronomical Observatory at Roden in the province of Drente offers facilities to students for obtaining observational experience and participation in instrument development.

State University of Leyden, Rapenburg 67-73, Leyden. Faculty of Law offers space law; Faculty of Science offers facilities for advanced studies including geophysics, astronomy and cryogenics.

State University of Utrecht, Kromme Nieuwe Gracht 29, Utrecht. Faculty of Law offers space law; Faculty of Science offers meteorology, ionospheric physics, plasma physics, astronomy, spectrochemical analysis, laboratory and theoretical astrophysics, radio-astronomy and solar and stellar astrophysics. The Space Research Laboratory (Huizingalaan 121, Utrecht) offers facilities for advanced studies in space research.

Technological Institute of Delft, P.O. Box 5, Delft. Electrical Engineering Department offers information transmission, theory of information and communication and automatic control, digital techniques and data processing, and terrestrial and space navigation. Related subjects are also studied.

Technological Institute of Eindhoven, Insulindelaan 2, Eindhoven. Department of Physics offers cryogenic physics. Electrical Engineering Department offers telecommunications and data-processing techniques.

University of Amsterdam. Faculty of Mathematical and Natural Sciences (Roetersstraat 1 a (c), Amsterdam) offers astronomy.

Free University, De Boelelaam 1115, Amsterdam 11. Faculty of Science offers meteorology and astronomy.

The Ministry of Education, Arts and Sciences, Nieuwe Uitleg 1, s'Gravenhage, offers Netherlands government scholarships for higher university studies in the Netherlands to graduate nationals of Austria, Denmark, the Federal Republic of Germany, Finland, Greece, Iceland, Norway, Poland, Spain, Sweden, Switzerland, Turkey and Yugoslavia. Tenure is a full or part academic year, at 350 florins per month, plus tuition.

Other scholarships, for one year at 3,500 florins, are available to nationals of Australia, Canada, India, Israel, Japan, the United Arab Republic and the United States of America.

Exchange scholarships for higher university studies in the Netherlands are available to nationals of Belgium, France, Italy, Luxembourg and the United Kingdom.

Royal Netherlands Academy of Sciences and Letters travel grants include Boïk Fund grants totalling 1,200 florins per year, open to scientific workers from all countries for study in the natural sciences in the Netherlands.

New Zealand

National and State academies

The Royal Society of New Zealand, Box 196, Wellington.

Government departments and official agencies

Department of Scientific and Industrial Research (DSIR), P.O. Box 8018, Wellington, C.I. Divisions include Applied Mathematics, Geophysics, Nuclear Sciences, Physics and Engineering. The Geophysics Division has the responsibility for the New Zealand Time Service and in conjunction therewith operates a

Danjon astrolabe for the very accurate determination of fundamental positions of stars for standard star catalogues, as part of an international programme. This leads to investigation of the motion of the terrestrial poles, the variability of the earth's period of rotation and relative displacements of land masses. The department administers the following fellowships :

National research fellowship, available to a national of the United Kingdom for scientific research in New Zealand. Candidate must have M.Sc. degree or equivalent. Tenure one year (renewable) at £1,135 [33] per annum, plus return tourist shipping fares, marriage allowance and up to £100 per year for incidental expenses. Applications to the New Zealand Senior Scientific Liaison Officer, Africa House, Kingsway, London, W.C.1.

Senior research fellowships (2 or 3) in the natural sciences, available to nationals of all countries. Candidates must have Ph.D. degree or equivalent qualification and a distinguished academic record ; a good working knowledge of English is required. Tenure is six to twelve months (renewable) at £1,695 to £2,230 per year, plus £250 for married fellows, transportation between recipient's home and place of study in New Zealand and travel expenses incurred during research. Applications to the Secretary, Department of Scientific and Industrial Research, as above.

New Zealand Meteorological Service, P O. Box 722, Wellington. Covers Fiji, Nandi Airport.

New Zealand National Space Research Committee.

Learned societies, professional institutions and other associations

Royal Astronomical Society of New Zealand, P.O. Box 3181, Wellington.

Government or official research establishments

Carter Observatory, Kelburn, Wellington, W.1. This national institution conducts activities including adult education in astronomy, co-operation with schools and colleges, and general astronomical research. The main research activities are connected with observations of solar phenomena and positional astronomy. The observatory supplies predictions of astronomical phenomena for government departments, firms and individuals.

Christchurch Geophysical Observatory of the geophysics division of DSIR, P.O. Box 2111, Christchurch C.I. Maintains vertical sounding ionosphere stations at Godley Head, Christchurch ; Rarotonga, Cook Islands ; Raoul Island, Kermadee Group ; Campbell Island and Scott Base, Antarctica. Conducts fundamental research into upper atmosphere physics, especially structure and dynamics of the ionosphere.

Mount John University Observatory, Lake Tekapo. The main programmes at this research institution are concerned with the stars and galaxies, taking full advantage of New Zealand's favourable latitude. Mount John was selected as the most favourable site in New Zealand for astronomical research. All programmes are based on international co-operative investigations.

New Zealand Magnetic Survey of the Geophysics Division of DSIR, Botanic Gardens, Christchurch, C.I. Magnetic observatories are operated at Apia, Western Samoa ; Amberley, near Christchurch, and Scott Base, Ross Dependency. There is a climatological observatory at Christchurch.

New Plymouth Astronomical Society Observatory, New Plymouth.

Universities and colleges

Central Institute of Technology, P.O. Box 177, Buick Street Petone, Wellington.

University of Auckland, P.O. Box 2175, Auckland C.I. Faculties of Engineering and Science offer mathematics, physics and electronics with advanced level options in ionospheric and plasma physics and radio astronomy.

The Radio Research Centre offers research facilities in long distance propagation of satellite signals and in the investigation of ionospheric irregularities using satellite transmission.

University of Canterbury, Private Bag, Christchurch. Faculties of Engineering and Science offer mathematics, physics and electronics, with advanced level options in upper atmospheric, ionospheric and space physics. An astronomy unit at stage I level is being introduced in 1967. There are research facilities up to the Ph.D. level on behaviour of satellite signals in the ionosphere, ionospheric absorption, micro-pulsation of the earth's magnetic field, and radar detection of meteors.

University of Otago, Dunedin. Faculty of Science offers mathematics and physics.

Victoria University of Wellington, Wellington. Faculty of Science offers mathematics and physics.

Commonwealth Scholarship and Fellowship Plan awards (15) for postgraduate study or research, administered by the Department of External Affairs (External Aid Division, Wellington), are available to nationals of Commonwealth countries for study in New Zealand. Candidates must normally be graduates of a university of their own country ; age limit 35. Tenure is normally two academic years at £58 6s. 8d. per month for postgraduates and £41 13s. 4d. for undergraduates, plus tuition, travel and other allowances.

Colombo Plan training awards (130) for study in New Zealand are available to nationals of countries in South and South-East Asia participating in the Colombo Plan. Candidates must be sponsored by their own Governments. Awards vary from £1 5s. to £3 per day, according to cost ; and there are certain other allowances.

New Zealand University Grants Committee, Box 8035, Wellington, offers post-doctoral fellowships to United Kingdom graduates with Ph.D. or equivalent qualification, age limit 35, tenable at any university in New Zealand for two years at £1,000 per annum. The committee also offers postgraduate scholarships to

[33] The currency referred to in this section is the New Zealand pound.

United Kingdom graduates with first or second class honours, tenable at any university in New Zealand for two years at £650 per year. For information about fellowships or studentships available to New Zealand nationals or students at New Zealand universities, see the UNESCO publication, *Study Abroad.* [34]

Niger

Universities and colleges

Ecole africaine de la météorologie et de l'aviation civile [African School of Meteorology and Civil Aviation], Boîte postale 746, Niamey.

Scholarships under the United Nations programme are offered to students from territories administered by Portugal, to enable them to complete their secondary education in Niger. Awards cover travel, board and lodging.

Nigeria

Government departments and official agencies

Nigerian Meteorological Service, Lagos.

Universities and colleges

Ahmadu Bello University, Zaria, Northern Nigeria. Faculties of Science and Engineering offer mathematics, physics, electronics.

Regional Meteorological Training Centre, Lagos. Established by the Government of Nigeria with the assistance of WMO, for the training of junior meteorologists, assistants and observers of the English-speaking countries in Africa. The training is designed in a phased programme, with a six-month course for observers, followed by a twelve-month course for assistants and another twelve-month course for junior meteorologists. Candidates for the observers' course should have GCE "O" level education and scientific aptitude; the assistants' course is open to observers and the junior meteorologists' course to assistants.

University of Ibadan, Ibadan. Faculty of Science offers mathematics and physics.

University of Ife, Ibadan. Faculty of Science offers mathematics and physics.

University of Lagos, Lagos. Faculties of Science and Engineering offer mathematics and science and engineering courses.

University of Nigeria, Naukka, Eastern Nigeria. Faculties of Science and Engineering offer mathematics, physics and engineering courses.

Under the Commonwealth Scholarship and Fellowship Plan, 8 scholarships for postgraduate study or research in Nigeria are available to citizens of other Commonwealth countries; age limit normally 35; unmarried. Tenure is usually two years, and awards are £700 per year personal allowance, plus tuition, books, travel and certain other allowances.

[34] UNESCO, *Study Abroad, 1966-1968,* Paris, 1966.

Norway

National and State academies

The Norwegian Academy of Science and Letters in Oslo, Drammensveien 78, Oslo. Publications include *Geofysiske Publikasjoner* and *Astrophysica Norvegica.* Subjects represented include geophysics, meteorology and astronomy.

Government departments and official agencies

Ministry of Defence, Storgaten 33, Oslo. Norwegian Defence Research Establishment. Ionospheric Group conducts research in ionospheric physics, especially aurora problems, using radio observations and rockets for studies of particles in flux, in co-operation with the Department of Physics of the University of Oslo and the Institute of Cosmic Physics.

Royal Norwegian Council for Scientific and Industrial Research, Gaustadalleen 30, Oslo. This is an independent organization for the promotion of scientific and industrial research. Travelling fellowships are awarded to university graduates for advanced training abroad.

Post-doctoral fellowships are made available to nationals of all countries for study of science and engineering in Norway. Candidates must have Ph.D. or equivalent, age under 35. Tenure is one year, renewable, at 20,000 kroner for single fellows or 22,000 kroner for married males, plus tuition and travel allowance.

Norwegian space activities are co-ordinated by the Council, which has established a Division for Space Activities with an Advisory Committee. Research is included as well as technological aspects of space activities.

Learned societies, professional institutions and other associations

Geophysical Commission Norske Meteorologiske Institutt, Blindern, Oslo.

Norwegian Astronautical Society, Postboks 43, Blindern, Oslo 3. Belongs to IAF.

Norwegian Meteorological Institute, Blindern, Oslo.

Government or official research establishments

Institute of Cosmic Physics. Co-operates with the Department of Physics of the University of Oslo and the Ionospheric Group of the Norwegian Defence Research Establishment in their special research project in ionospheric physics.

Universities and colleges

Government awards are available through the Ministry for Foreign Affairs, Oslo, for study in Norway in fields including natural sciences. Awards are open to students and graduates under 30 from Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, the Federal Republic of Germany, Finland, France, Iceland, India, Ireland, Israel, Italy, the Netherlands, Poland, Spain, Sweden, Switzer-

land, Turkey, the USSR, the United Arab Republic, the United Kingdom and Yugoslavia. Tenure is eight months, and the amount of the award 4,800 kroner.

Research fellowships (5) are open to university graduates from Czechoslovakia, Poland, the USSR and Yugoslavia, age 30 to 40. Tenure is eight months for nationals of the USSR and four months for others, at 800 kroner per month, plus certain allowances.

Norwegian Agency for International Development, Fridtjof Nansens plass 6, Oslo, offers scholarships to scientific research workers, administrative personnel, advanced students, foremen, instructors, technicians and skilled workers from developing countries, for post-doctoral research, postgraduate studies, theoretical or practical training in Norway.

For information about fellowships and studentships available to Norwegian nationals or students at Norwegian universities, see the UNESCO publication, *Study Abroad*. [35]

Bergen University, Bergen. Accepts undergraduate and graduate students for basic training. Courses offered include meteorology. Faculty of Natural Sciences offers opportunities for postgraduate training within a special research project on cosmic-ray problems. Two groups are involved, one using rocket equipment for measuring energy and flux of solar cosmic ray protons in the region of 150,000 to 80,000 m and studying secondary effects when these particles reach the atmosphere. The second group uses balloon equipment for measuring secondary effects of cosmic rays, especially the intensity of X-ray particles in the 30,000 m region.

Oslo University, Oslo 3. Accepts undergraduate and graduate students for basic training. Courses offered include geophysics. Department of physics, in co-operation with the ionospheric group of the Norwegian Defence Research Establishment and the Institute of Cosmic Physics, offers opportunities for postgraduate training within a special research project on ionospheric physics. Aurora problems are investigated, using radio observations and rockets for studies of particles in flux. Department of astronomy offers opportunities for postgraduate training with a special research project on solar physics, using both optical and radio-astronomical methods of observation.

An Olav Brunborg memorial scholarship of 1,200 kroner is open to a student of the University of Reykjavik, Iceland, for study in Norway.

Pakistan

National and State academies

Pakistan Association for the Advancement of Science, University Institute of Chemistry, Punjab University, the Mall, Lahore. Concerned with the promotion of science in all its branches, including its applications to practical problems and research.

[35] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Government departments and official agencies

Pakistan Atomic Energy Commission, P.O. Box 3112, Karachi. Has established training and research centres in various parts of the country. Institutes under its control include :

Pakistan Institute of Nuclear Science and Technology, Islamabad : a research and training institute with a 5MW research reactor of swimming-pool type and supporting laboratories ;

Atomic Energy Centre, Lahore : has research and training facilities ;

Atomic Energy Centre, Dacca : has research and training facilities which, when complete, will include a 3MEV Van-de-Graaf accelerator.

Pakistan Council of Scientific and Industrial Research, Block 95, Pakistan Secretariat, Frere Road, Karachi. The council works through four regional laboratories, which include Central Laboratories, Karachi : research divisions include physics, chemistry and engineering.

Pakistan Meteorological Department, Frere Road, Karachi.

Pakistan Space and Upper Atmosphere Research Committee, 23/A, Block 6, Pechs, P.O. Box 3125, Karachi. Provides training facilities in ionospheric physics, atmospheric physics, celestial mechanics, dynamics of rockets and satellites, astronomy and astrophysics, electronics, and rocket-launching techniques. Regular courses are not offered, but instruction for small groups can be arranged when required. The rocket-launching techniques pertain only to the launching of Nike-Cajun, Nike-Apache and meteorological rockets. Training facilities in the operation and maintenance of radar are also offered.

Government or official research establishments

Astronomical observatory of the University of the Punjab, Cust Road, Lahore. Includes a research institute equipped with a 7-inch telescope, a 4-inch solar telescope, a 4-inch astro-camera, a transit instrument and other instruments.

Geophysical Institute, Quetta. Conducts geophysical research. Provides training facilities in geomagnetism.

Institute of Meteorology and Geophysics, Karachi. Provides training facilities in meteorology, ionospheric and atmospheric physics, and geophysical sciences such as seismology. The institute is operated by the Pakistan Meteorological Department.

Universities and colleges

Ministry of Education, Rawalpindi, under the cultural scholarship scheme, offers 125 scholarships and research fellowships to nationals of all countries for study in general subjects in Pakistan. The scheme includes three scholarships for South West Africans under the United Nations programme. Duration depends on the field of study (four years for engineering) ; value is 250 rupees per month for scholarships, 400 rupees for fellowships, plus certain other allowances.

Commonwealth Scholarship and Fellowship Plan awards tenable in Pakistan are available to Commonwealth citizens, normally graduates. Tenure is two years, awards covering maintenance, tuition and travel.

Scholarships under the United Nations programme are offered to students from Trust Territories, Non-Self-Governing Territories and territories under Portuguese administration, for undergraduate or postgraduate study in Pakistan, in fields including science and engineering. The value is 250 rupees per month, plus 200 rupees per year for equipment and 200 rupees per year study tour allowance.

For fellowships, studentships and study grants available to nationals of Pakistan and to graduates from Pakistan universities, see the UNESCO publication *Study Abroad.* [36]

East Pakistan University of Engineering and Technology, Ramna, Dacca, East Pakistan. Engineering colleges include: N.E.D. Engineering College, Karachi; Engineering College, Hyderabad; Engineering College, Lahore; Ahsanullah Engineering College, Dacca; Engineering College, Peshawar; Dawood Engineering College, Karachi.

University of Dacca, Ramna, Dacca, East Pakistan. Faculty of Science offers studies in cosmic rays, atmospheric physics, spectroscopy and electronics as part of the course leading to the M.Sc. degree in physics.

University of Karachi, University Campus, University Road, Karachi 32, West Pakistan. Includes Faculty of Engineering. Faculty of Science offers spectroscopy as a subject in the course for M.Sc. in physics.

University of the Punjab, Lahore, West Pakistan. Department of Chemistry, Mathematics and Physics offers electronics as part of the M.Sc. course. Department of Astronomy offers elementary astronomy as one of the elective subjects for graduation in the Faculty of Arts and Science. The three-year course for an honours degree can be offered with astronomy as a major subject. Astronomy can also be offered as an optional paper by students of the M.Sc. course in physics, and celestial mechanics can be offered as an optional subject by students in the master's degree course in mathematics.

Scholarships available to nationals of all countries, who should hold a master's degree of the University of the Punjab, include 12 research scholarships for study in any field, endowment scholarships in mathematics and physics, and the Kapurthala studentship in natural sciences. Tenure is two academic years, at 300 rupees per month.

University of Rajshani, Rajshani, East Pakistan. Faculty of Science, Department of Physics, offers courses including cosmic rays, atmospheric physics, electronics and spectroscopy.

University of Sind, Hyderabad, West Pakistan. Includes Departments of Mathematics, Physics and Chemistry. The M.Sc. course in physics includes nuclear physics, cosmic rays, quantum mechanics, atomic and molecular structure, spectroscopy and electronics.

[36] *Ibid.*

Panama

National and State academies

Academia Nacional de Ciencias de Panamá [National Academy of Sciences of Panama], Apdo. 4570, Panama City.

Universities and colleges

Panama University, Apdo. 3277, Panama City. Faculty of Science offers mathematics and physics; Faculty of Engineering offers astronomy.

Awards of the Colombia-Panama Cultural Convention are offered on a reciprocal basis to Colombian nationals for study in Panama. Studentships are for one academic year, covering travel, tuition and maintenance. Grants for university lecturers to attend courses cover travel and residence. Other grants enable professors, research workers and notable scientists and technologists to attend short courses and conferences.

Studentships of the Inter-American Convention for the Encouragement of Cultural Exchange are offered to nationals of the United States of America for study in Panama. Awards cover maintenance and fees.

Paraguay

Universities and colleges

There are no special fellowships in fields related to peaceful uses of outer space, but some general grants are available, for example through the Inter-American Convention for the Promotion of Cultural Exchange and the Institute of International Education of the United States of America.

The teaching institutions in Paraguay do not include in their general curricula, or as special courses, any of the space science subjects, but the following institutions offer courses in basic subjects:

Escuela Superior de Filosofía, Ciencias y Educación [School of Philosophy, Science and Education], Calle Eligio Ayala 128, Asunción, includes a Department of Physical Science and Mathematics;

National University of Asunción, Colón 63, Asunción, includes a Faculty of Physics and Mathematics; the Institute of Sciences (Avenida España 1098, Casilla Correo 1141, Asunción), includes Departments of Physics, Chemistry and Mathematics.

Peru

National and State academies

Academia Nacional de Ciencias del Perú [National Academy of Science of Peru], Casilla 1974, Lima.

Academia Nacional de Ciencias Exactas, Físicas y Naturales de Lima [Lima Academy of Exact, Physical and Natural Sciences], Casilla 1974, Lima.

Government departments and official agencies

Dirección General de Meteorología del Perú [National Meteorological Service], Avda. Arequipa 5200, Apartado 1308, Miraflores, Lima, includes a Climatology Department.

Learned societies, professional institutions and other associations

Instituto Peruano de Relaciones Interplanetarias [Peruvian Interplanetary Institute], Lima. Belongs to IAF.

Government or official research establishments

Instituto Geofísico del Perú [Peruvian Geophysical Institute], Apartado 3747, Lima. Founded as Huancayo Magnetic Observatory of the Carnegie Institute of Washington, D.C., United States of America, and transferred to the Peruvian Government in 1947. Operates observatories at Huancayo, Lima and Talara; co-operates with the NASA Satellite Tracking Station at Ancon, with the Environmental Science Services Administration, with the United States Bureau of Standards Radar Scatter Station at Jicamarca and with the Optical Tracking Station of the Smithsonian Institute of the United States of America at Arequipa. Interests include magnetic, ionospheric, meteorological, seismological and geophysical studies, including cosmic-ray, infrasonic and solar activity research.

Scholarships (5) in geophysics, physics, astrophysics and experimental electronics are offered to graduates or students of all countries.

Universities and colleges

The Ministry of Public Education, Lima, offers grants for study in Peru, under the Inter-American Convention for Cultural Interchange, to nationals of Bolivia (2), Panama (1), Paraguay (1), the United States of America (2) and Venezuela (2). Tenure is one year, covering maintenance, tuition and some other expenses.

National University of San Antonio Abad del Cuzco, Aptdo. 167, Cuzco. Faculty of Science offers physics, mathematics and meteorology.

National University of San Marcos de Lima, Aptdo. 454, Lima. Faculty of Science offers physics, mathematics, meteorology, geophysics, climatology and astronomy.

National University of San Cristobal de Huamanga Ayacucho. Faculty of Natural Sciences offers mathematics and physics.

National University of Trujillo, Calle Diego de Almagro, Trujillo. Includes Faculty of Physical and Mathematical Sciences.

National University of Engineering, Casilla 1301, Lima. Faculty of Science and Mathematics offers physics, mathematics, astronomy and geodesy, radio technology and communications. Studentships for specializations in engineering are offered to university students from all countries, for one academic year. Student exchange arrangements are offered also.

Philippines

Government departments and official agencies

National Research Council of the Philippines, University of the Philippines, Quezon City. Includes sections of physical and mathematical sciences, engineering and industrial research.

National Science Development Board, Port Area, Manila.

Philippine Atomic Energy Commission, 727 Herran Street, Manila.

Government or official research establishments

National Institute of Science and Technology, 727 Herran Street, P.O. Box 774, Manila. Conducts research in aeronautical engineering.

Universities and colleges

The Department of Foreign Affairs, Manila, administers (*a*) Colombo Plan Scholarships and Training Awards available to nationals of Colombo Plan member countries for study in the Philippines in fields determined through bilateral negotiations; awards cover maintenance, tuition, travel, books etc.; (*b*) scholarships offered under the United Nations programme to students from Trust Territories and Non-Self-Governing Territories for study in the Philippines; awards cover tuition and other fees. For information on scholarships and study grants for nationals of the Philippines to study in other countries, see the UNESCO publication, *Study Abroad*.[37]

Araneta University, Victoneta Park, Malabon, Rizal. Includes Institutes of Engineering, Science and Graduate Studies and Applied Research. Scholarships are available to nationals of Asian countries (particularly neighbouring countries) who are educated to university entrance standard. Awards cover either cost of tuition, lodging and other fees, or a monthly allowance of 200 pesos, plus travel grant.

Ateneo de Manila University, P.O. Box 154, Loyola Heights, Quezon City. A programme on outer space, with particular reference to research problems relevant to the Philippines and South-East Asia, is planned.

Feati University, Santa Cruz, Manila. Includes Institutes of Science and of Engineering and Technology. Scholarships (3) in fields including engineering and physics, covering tuition and other fees, are available to nationals of Non-Self-Governing Territories.

University of the Philippines, Diliman, Rizal, offers courses in elementary and interpretational astronomy.

University of Santo Tomás (Catholic University of the Philippines), España Street, Manila. Includes Faculty of Engineering, College of Science and Graduate School. International study awards are available to nationals of all countries who have completed secondary school education; candidates should be of high scholastic ability. Awards cover tuition fees.

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[37] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

Poland

National and State academies

Polish Academy of Sciences, Palac Kultury i Nauki, Warsaw. Section III : mathematics, astronomy, physics, chemistry, geophysics, geology and geography ; section IV : technical sciences. Publications include "Review of the Polish Academy of Sciences" and "Bulletin of the Polish Academy of Sciences", divided into series for the different subject groups.

The academy offers fellowships and studentships to experienced research workers to continue their work or scientific studies, as follows :

Three UNESCO scholarships are offered to nationals of all countries, with thorough knowledge of English, French, German or Russian, and preferably a knowledge of Polish ; tenure is three months at 3,000 zlotys per month, plus certain expenses ;

Research grants are offered to nationals of developing countries, for thirty months at 3,000 or 2,400 zlotys per month, plus lodging expenses ;

Two grants are available for nationals of Scandinavian countries, for nine months at 3,000 zlotys per month, plus certain expenses ;

Reciprocal fellowships, at from 2,400 to 4,800 zlotys per month, are available for research workers from China, Czechoslovakia, the Democratic Republic of Germany, France, Hungary, Italy (4), Romania, the United Kingdom (4), the USSR and Yugoslavia.

Government departments and official agencies

National Committee for the Exploration of Cosmic Space, Al. Ujazdowskie 4, Warsaw.

Committee on Research in and Peaceful Uses of Outer Space, Palac Kultury i Nauki, Warsaw.

Learned societies, professional institutions and other associations

Polish Astronautical Society, Palac Kultury i Nauki, Warsaw, pok. 2324. Affiliated to the Academy of Sciences, and represents Poland on IAF. Issues the quarterly, *Astronautyka.*

Polish Astronomical Society, Al. Ujazdowskie 4, Warsaw. Affiliated to the Academy of Sciences. Issues the quarterly, "Progress in Astronomy".

Polish Meteorological and Hydrological Society, Palac Kultury i Nauki, Warsaw. Affiliated to the Academy of Sciences. Issues the quarterly, "Geophysical Review".

Polish Amateur Astronomical Society, ul. Ludwika Solskiego 30/8, Kracow. Issues the monthly, "Urania" and annual scientific supplements.

Government or official research establishments

Astronomical Observatory of Warsaw University, Al. Ujazdowskie 4, Warsaw.

State Institute of Hydrology and Meteorology, ul. Podleśna 61, Warsaw.

Astronomical Research Institute of the Polish Academy of Sciences, Al. Ujazdowskie 4, Warsaw, comprises the following :

Department of Astrophysics I, ul. Sienkiewicza 30, Toruń (research in spectroscopy, stellar astronomy and radio-astronomy) ;

Department of Astrophysics II, Al. Ujazdowskie 4, Warsaw (research in polarization of light from stars, absorption, and interstellar magnetic fields) ;

Department of Astronomy and Celestial Mechanics, ul. Sloneczna 36, Poznan ;

Geophysical Institute of the Polish Academy of Sciences, ul. Pasteura 3, Warsaw (operation of a latitude station at Borowiec, near Poznan).

Universities and colleges

While there is no direct training in Poland in scientific investigations carried out with the use of rockets or rocket-propelled vehicles, certain aspects of education relate to the peaceful uses of outer space, as follows :

Sporadic instruction concerning observations of the artificial satellites of the earth is given in the Polish stations which are part of the world geodetic network;

Periodic seminars are held by astronomical observatories on the scientific interpretation of the results of such observations in the fields of dynamic geodesy, three-dimensional geodesy, celestial mechanics, etc. ;

University-level instruction is given in the appropriate faculties in such sciences as astronomy, radio-astronomy, physics of the atmosphere (ionosphere and exosphere), advanced geodesy, aspects of biology and physiology, practical and theoretical mechanics, and celestial mechanics.

The Ministry of Culture and Arts, Krakowskie Przedmieście 15-17, Warsaw, offers studentships to nationals of all countries, especially developing countries, for up to five years, plus one year to study Polish, at 1,000 zlotys per month, plus certain other grants.

The Ministry of Higher Education, Warsaw, offers similar studentships to nationals of developing countries, particularly African countries. Studentships under the United Nations programme are offered to students from non-autonomous countries, territories administered by Portugal, and South West Africa, for advanced studies in Poland. Polish government grants for the completion of studies in Poland are offered to students from Austria, Cuba, Denmark, Finland, France, Italy, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, the United States of America and Yugoslavia.

Exchanges for scientific and technological personnel, university staff and postgraduate students have been arranged with the British Council, 65 Davies Street, London W.1.

Adam Mickiewicz University, Stalingradzka 1, Poznan. Faculty of Mathematics, Physics and Chemistry offers astronomy.

Bolesław Bierut University, Plac Uniwersytecki 1, Wroclaw. Faculty of Mathematics, Physics and Che-

mistry offers heliophysics, observational astrophysics, celestial mecnanics and theoretical astrophysics.

Jagiellonian University, Gołebia 24, Kracow. Faculty of Mathematics, Physics and Chemistry offers theoretical astronomy and observational astronomy.

Nicholas Copernicus University of Torun, Fosa Staromiejska 3, Toruń. Faculty of Mathematics, Physics and Chemistry offers astrophysics.

University of Warsaw, Krakowskie Przedmieście 26-28, Warsaw. Faculty of Mathematics and Physics offers atmospheric physics, aeromechanics, astrophysics and astronomy.

Portugal

National and State academies

Lisbon Academy of Sciences, Rua de Academia das Ciências 19, Lisbon 2.

Government departments and official agencies

Institute of Higher Culture, Praça do Príncipe Real 14, 1º., Lisbon 2. Publications include works on science.

Committee for Nuclear Energy, Rua de S. Pedro de Alcántara 45, Lisbon 2.

National Meteorological Service, Rua Saraiva de Carvalho 2, Lisbon 3. Publications include daily, weekly, quarterly and yearly meteorological and geophysical bulletins.

Learned societies, professional institutions and other associations

Portuguese Association for the Advancement of Science, Praça do Príncipe Real 14, 2º., Lisbon 2.

Centre for Astronautical Studies, Palácio da Independência, Largo de S. Domingos, Lisbon 2. Belongs to IAF.

Foundations and trusts

Gulbenkian Institute of Science, Av. do Brasil, Lisbon 5. Offers grants and prizes.

Government or official research establishments

National Institute for Industrial Investigations, Rua Garcia da Orta, 68, 1º., Lisbon 2.

National Civil Engineering Laboratory, Av. do Brasil, Lisbon 5.

Lisbon Astronomical Observatory, Tapada, Lisbon. Publications are *Boletim* and *Dados Astronómicos*.

Universities and colleges

There are at present in Portugal no facilities for education and training directly in the field of exploration of cosmic space ; the information which follows relates to facilities in basic subjects.

The Instituto de Alta Cultura offers, for study in Portugal, two bursaries to British graduates with some knowledge of Portuguese, tenable for nine months at 2,000 escudos per month, with 5,000 escudos for travel expenses, etc. It also offers eleven bursaries, on a reciprocal basis, to nationals of the Federal Republic of Germany, Spain, and the United Kingdom ; and some bursaries to Portuguese nationals living abroad and wishing to pursue their advanced studies in Portugal. The institute offers ten studentships to Spanish nationals for scientific research in Portugal, by an exchange arrangement with the Higher Council of Scientific Investigations in Spain.

For information on fellowships, studentships and study grants available to Portuguese nationals and to students at universities in Portugal, see the UNESCO publication, *Study Abroad*.[38]

Coimbra University, Astronomical Observatory, Santa Clara, and Geophysical Institute, Coimbra.

University of Lisbon, Cidade Universitária, Lisbon 4. Includes the Geophysical Institute, Rua da Escola Politécnica, and the Astronomical Observatory of the Faculty of Sciences.

University of Porto, Oporto. Includes the Climatological and Hydrological Institute and the Geophysical Institute and Meteorological Observatory, V.N. de Gaia.

Romania

National and State academies

Academy of the Romanian Socialist Republic, Calea Victoriei 125, Bucharest. Includes sections of mathematics, physics, chemistry, technical sciences, geology, geography, geophysics, biology and medical sciences. The Commission on Astronautics represents Romania on IAF.

Government departments and official agencies

Romanian National Committee of Geodesy and Geophysics, Bul. Ana Ipătescu 21, Bucharest.

Learned societies, professional institutions and other associations

Section of Atomic Physics, Str. M. Kogălniceanu 1, Cluj ; attached to the Institute of Atomic Physics, raionul Lenin, Comuna Măgurele, Căsuţa poştală 35.

Society of Physical and Chemical Sciences of the Socialist Republic of Romania, Str. Nuferilor 23, Bucharest.

Society of Mathematical Sciences of the Socialist Republic of Romania, Strada Academiei 14, Bucharest.

Government or official research establishments

Centre of Geophysical Research, Bul. Ana Ipătescu 21, Bucharest. Attached to the section of geology

[38] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

and geography of the Academy of the Socialist Republic of Romania.

Institute of Juridical Research, Bul. Gh. Gheorghiu Dej 33-35, Bucharest. Concerned with study of space law.

Institute of Physics, Calea Victoriei 114, Bucharest. Attached to the section of physics of the Academy of the Socialist Republic of Romania.

Institute of Atomic Physics, raionul Lenin, Comuna Măgurele, Căsuța poștală 35. Attached to the section of physics of the Academy of the Socialist Republic of Romania.

Institute of Theoretical and Applied Physics, Cluj University Research Institute.

Institute of Physiology " Prof. Dr. D. Danielopolu ", Bulevardul 1 Mai, II, Bucharest. Attached to the section of medical sciences of the Academy of the Socialist Republic of Romania. Includes a laboratory of aerospace physiology.

Institute of Mathematics, Str. M. Eminescu 47, Bucharest. Attached to the section of mathematics of the Academy of the Socialist Republic of Romania.

Institute of Mathematics, Str. Universității 16, Iasi. Attached to the section of mathematics of the Academy of the Socialist Republic of Romania.

Institute of Fluid-mechanics, Str. Constantin Mille 15, Bucharest. Attached to the section of technical sciences of the Academy of the Socialist Republic of Romania. Research interests include gasdynamics, thermoaerodynamics of reaction motors and astrodynamics.

Meteorological Institute, Șos. București-Ploiești 97, Bucharest.

Technical Museum " Prof. Ing. Dimitrie Leonida ", Str. Candiano Popescu 2, Bucharest. Exhibits include telecommunications.

Astronomical Observatory, Str. Cuțitul de Argint 5, Bucharest. Includes sections of astronomy and astrophysics. Attached to the section of mathematics of the Academy of the Socialist Republic of Romania.

Universities and colleges

Th Ministry of Foreign Affairs, Bucharest, offers studentships under the United Nations programme for university study in Romania, in fields including mathematics and chemistry, to students from non-autonomous territories. Tenure is six years maximum, at 1,000 lei per month, plus travel.

The Ministry of Education, Bucharest, offers grants for study or scientific research in Romania to graduate nationals of countries having cultural agreements with Romania; age 18 to 35 years. Tenure is two to six years.

Exchanges for scientific and technological personnel, university staff and postgraduate students have been arranged with the British Council, 65 Davies Street, London W.1.

Bucharest Institute of Construction, Bul. Republicii 176, Bucharest. Faculty of Hydrotechnology offers mathematics.

Polytechnic and technological institutes of higher learning deal with space research problems, including dynamics of a body of variable mass, the theory of movement of rockets and artificial satellites, theory of supersonic and hypersonic flight and its application to rocket aerodynamics, theory of magnetohydrodynamics and of rarefied gases, rocket propulsion, guidance and attitude control, chemical jet engines, electric rocket engines, construction of rockets and space craft, cosmic radiations and their registration, circumterrestrial radiation belts, Tcherenkov counters and nuclear emulsions as instruments for the registration of particles and processes of high energy, propagation in telecommunications between land stations and objects in space, types of antenna used for space vehicles, problems of reception over long distance and below the noise level, problems of location of space vehicles by radar using the Doppler-Fizeau effect.

Brașov Polytechnic Institute, Str. Nicolae Iorga 2, Brașov. Faculty of Mechanics offers mathematics.

Bucharest Polytechnic Institute, Calea Griviței 132. Faculty of Energetics offers mathematics and physics. Faculty of Mechanics offers aerodynamics and gasdynamics. Faculty of Electronics and Telecommunications offers radiotechnology and theory of information transmission.

Cluj Polytechnic Institute, Str. Emil Isac Nr. 15, Cluj. Faculties of Mechanics and Electromechanics offer mathematics and physics.

Galati Polytechnic Institute, Str. Republicii Nr. 111, Galati. Faculty of Mechanics offers mathematics.

Iași Polytechnic Institute, Calea 23 August 22, Iași. Faculties of Electrotechnics, Hydrotechnology and mechanics offer physics and mathematics.

Timișoara Polytechnic Institute, Bul. 30 Decembrie Nr. 2, Timișoara. Faculties of Mechanics, Electromechanics and Construction offer physics and mathematics.

Medical-Pharmaceutical Institutes of Higher Education offer space biology and space medicine, including the effects of acceleration and deceleration on the human organs, the effects of hyperbarism and hypobarism on the organs, the technique of using radiotelemetric information for checking cardinal body functions, the vestibulary sense and its adaptation to the conditions of space flight, the effects of weightlessness and of cosmic radiation, the physiopathology of the neurotogenic mechanism and the influence of atomic radiation on human genetics. These institutes are at Str. Dionisie Lupu 37, Bucharest; Str. 1 Mai 13, Cluj; Str. Universității 10, Iași; Str. Universității 38, Tîrgu-Mures; and Piața 23 August 2, Timișoara.

The universities of Romania offer various disciplines concerned with space exploration, such as astrodynamics, space flight mechanics, astronomy, observation and tracking of artificial satellites, upper atmosphere physics, cosmic radiation physics, solar physics, space physics, meteorology, space biology and biochemistry, thermodynamics and geodesy.

Bucharest University, Bulevardul Gh. Gheorghiu Dej 64, Bucharest. Faculty of Mathematics and Mechanics

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offers mathematics and astronomy. Faculty of Physics offers atomic and nuclear physics, optics, electronics, spectroscopy, radioactivity, geophysics, meteorology, biophysics, theory of elementary particles, quantum theory of fields. Faculty of Geology and Geography offers climatology.

Cluj University, Str. M. Kogălnicenau 1. Faculty of Mathematics and Mechanics offers mathematics and astronomy. Faculty of Physics offers general physics, atomic and nuclear physics, theory of elementary particles, quantum theory of fields, electronics, theoretical physics and solid body physics. Faculty of Biology and Geography offers climatology.

Iaşi University, Calea 23 August 11. Faculty of Mathematics and Mechanics offers general mathematics. Faculty of Physics offers electricity, electronics, theoretical physics and spectroscopy. Faculty of Biology and Geography offers meteorology and climatology.

Craiova University, Str. A1 I. Cuza 31. Includes Faculty of Mathematics.

Timisoara University, Bulevardul Pîrvan 4. Includes Faculty of Mathematics and Mechanics and Faculty of Physics.

Senegal

Government departments and official agencies

Office de la recherche scientifique et technique outremer (ORSTOM) [French Overseas Office of Scientific and Technical Research], B.P. 1386, Dakar.

Government or official research establishments

Centre de géophysique [Geophysics Centre], M'Bour. Attached to ORSTOM. Conducts studies in magnetism, gravimetry and seismology.

Universities and colleges

University of Dakar, Fann Parc, Dakar. Faculty of Science offers mathematics and physics. Affiliated institutes include the Institut de physique météorologique [Institute of Meteorological Physics].

Scholarships for study or research are offered to graduates from all countries who wish to proceed to a higher degree and have a good knowledge of French. Selected students from English-speaking African countries may be admitted to a preliminary course in French. Tenure is one year, renewable, if progress is satisfactory ; value is 22,500 CFA[39] per month.

South Africa

National and State academies

Royal Society of South Africa, c/o University of Cape Town, Rondebosch.

[39] Francs of the French Community (Africa).

Government departments and official agencies

South African Council for Scientific and Industrial Research (CSIR), P.O. Box 395, Pretoria.

Learned societies, professional institutions and other associations

Astronomical Society of Southern Africa, c/o The Royal Observatory, Cape Town.

Interplanetary Craft Research Society of Southern Africa, P.O. Box 9710, Johannesburg.

South African Institute of Physics, c/o P.O. Box 395, Pretoria.

South African Interplanetary Society, P.O. Box 6351, Johannesburg.

Government or official research establishments

Boyden Observatory, P.O. Box 334, Mazelspoort, Bloemfontein. Maintained by Harvard University, United States of America, Armagh Observatory, Northern Ireland, Dunsink Observatory, Ireland, the Council of German Observatories and the Royal Observatory of Belgium.

Lamont-Hussey Observatory, P.O. Box 875, Naval Hill, Bloemfontein. Operated by the University of Michigan, United States of America.

Leiden Southern Station, P.O. Box 13, Broederstroom.

Magnetic Observatory, P.O. Box 32, Hermanus. Conducts studies of geomagnetism, seismology and cosmic rays.

National Institute for Telecommunications Research of CSIR, P.O. Box 3718, Johannesburg. Conducts study of radio wave propagation and associated phenomena and uses of radio in space research. Operates a Radio Space Research Station at Hartebeesthock, Transvaal, in accordance with a contract between NASA of the United States and CSIR.

National Physical Research Laboratory of CSIR, P.O. Box 395, Pretoria. Specialist divisions include optics, radioactivity, nuclear physics, spectroscopy, atmospheric physics and geophysics.

Radcliffe Observatory, Pretoria. Conducts photographic, spectroscopic and photoelectric studies ; the 74-inch reflector telescope is among the largest in the southern hemisphere.

Radio Space Research Station, Hartebeesthock, Transvaal (see under National Institute for Telecommunications Research). Engaged in satellite tracking and data acquisition, and provides deep space instrumentation facility.

Radio Tracking Station, Paarvlei. Operates on behalf of CNES of France.

Republic Observatory of CSIR, Gill Street, Johannesburg. Principal equipment includes 26 1/2-inch, 9-inch and twin 7/6-inch refractors. At Hartebeestpoort annexe, there is a 10-inch photographic refractor. Principal long-term systematic programmes include double-

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star astronomy and observations of minor planets and comets.

Royal Observatory, Cape Town. Controlled and maintained by the British Science Research Council as the southern station of the Royal Greenwich Observatory. Equipment includes a reversible 6-inch transit circle, 40-inch, 30-inch and 18-inch reflectors, 24-inch, 18-inch and 13-inch refractors ; an automatic Lyot Ha heliograph and a Danjon astrolabe, with access to the 74-inch reflector at Radcliffe Observatory, Pretoria, for spectroscopic observation. The observatory specializes in astrometric and photometric work.

Universities and colleges

Entrance to the universities of South Africa is being progressively restricted on racial lines.

For information on study or research grants available to nationals of South Africa and to graduates from South African universities, see the UNESCO publication, *Study Abroad*.[40]

The South African Government offers three post-graduate scholarships annually for study or research at a South African university or research institution to graduates from the United Kingdom. Tenure is one academic year (renewable) ; the value is 70 rand per month, plus fees and travel.

Potchefstroom University for Christian Higher Education, Potchefstroom, Transvaal. Faculty of Science offers mathematics and physics. Attached to the university are research institutes for physics and automation.

Rhodes University, Grahamstown. Faculty of Science offers mathematics and physics.

University College, Durban (for Indian students), Private Bag, Durban. Faculty of Science offers mathematics and physics.

University College of Fort Hare (for Xhosa students and Bantus from Transkei), Fort Hare, Cape Province. Faculty of Science offers mathematics and physics.

University College of the North (for Tsonga, Sotho and Venda students), P.O. Sovenga, Pietersburg. Faculty of Mathematics and Natural Sciences offers mathematics and physics.

University College of the Western Cape (for coloured, Griqua and Malay students), Bellville. Faculty of Science offers mathematics and physics.

University College of Zululand (for Zulu students), Private Bag, Kwa-Dlangezwa, via Empangeni, Natal. Faculty of Science offers mathematics and physics.

University of Cape Town, P.O. Box 594, Cape Town. Faculty of Science offers mathematics, physics, nuclear physics and astronomy. Faculty of Engineering offers electronics.

The J. W. Jagger scholarship of 400 rand per year for three years is available to a student from the United Kingdom.

University of Natal, King George V Avenue, Durban, P.O. Box 375, Pietermaritzburg. Faculty of Science offers mathematics and physics at both centres, and engineering at Durban only. A group is actively engaged in research in upper atmospheric physics.

University of the Orange Free State, P.O. Box 339, Bloemfontein. Faculty of Science offers mathematics and physics.

University of Port Elizabeth (bilingual ; Afrikaans and English), P.O. Box 1600, Port Elizabeth. Faculty of Science offers mathematics and physics.

University of Pretoria, Brooklyn, Pretoria. Faculties of Science and Engineering offer mathematics and physics.

University of South Africa (correspondence and examining institution for external students only, multi-racial and bilingual), P.O. Box 392, Pretoria. Faculty of Science offers mathematics and physics.

University of Stellenbosch, Stellenbosch. Faculty of Science offers mathematics and physics. Faculty of Engineering offers electrotechnology and electronics.

Bursaries are available to nationals of the Federal Republic of Germany (2) and the Netherlands (5). Tenure is one year (renewable), at approximately 700 rand per year for German students and approximately 120 rand per year for Dutch students.

University of the Witwatersrand, Johannesburg, Transvaal. Faculty of Science offers mathematics, physics, atmospheric physics and nuclear physics. Faculty of Engineering offers electrical engineering and electronics. Attached to the university are the Bernard Price Institute of Geophysical Research and the Nuclear Physics Research Unit. Instruction is in English.

Spain

National and State academies

Real Academia de Ciencias Exactas, Físicas y Naturales [Royal Academy of Exact, Physical and Natural Sciences], Valverde 22-24, Madrid. Includes Sections for Exact, Physical and Natural Sciences.

Real Academia de Ciencias y Artes de Barcelona [Barcelona Royal Academy of Sciences and Arts], Rambla de Estudios 115, Barcelona. Affiliated institutes include Observatorio Astronómico Meteorológico y Sísmico Fabra [Astronomical, Meteorological and Seismical Observatory], Tibidabo, Barcelona.

Government departments and official agencies

Comisión Nacional de Investigación del Espacio [National Commission for Space Research], Serrano 43, Madrid.

Consejo Superior de Investigaciones Científicas (CSIC) [Higher Council for Scientific Research], Serrano 117, Madrid. Engaged in development and co-ordination of research in universities, research institutes and scientific establishments. The eight *patronatos* include the following :

[40] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

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Patronato Raimundo Lulio of Theological, Philosophical and Juridical Sciences, which includes the Francisco de Vitoria Institute of International Law ;

Section of Aerospace Law, Duque de Medinoceli 4, Madrid ;

Patronato Alfonso el Sabio of Mathematics, Physics and Chemistry, including the National Academy of Mathematics, the National Council of Physics, the Institute of Physical Chemistry, the National Institute of Geophysics, the Cosmic Physics Observatory of Ebro de Tarragona, the Observatory of Cartuja de Granada, the Astronomical Observatory of Santiago de Compostela and the National Union of Astronomy and Related Sciences (UNACA) ;

Patronato Juan de la Cierva of Technical Research, including the Institute of Optics, the Institute of Electricity and Automation, the Institute of Scientific Instrumentation, the National Institute of Electronics and the Cryogenic Experimental Centre ;

Geographical and Cadastral Institute, Calle del General Ibañez de Ibero 3, Madrid ; includes the Section of Geodesy, Geophysics and Meteorology, the National Commission of Geodesy and Geophysics, and the National Commission of Astronomy ;

Nuclear Energy Council, Ciudad Universitaria, Avenida Complutense 22, Madrid 3, for co-ordination and control of research into the applications of nuclear energy ;

National Meteorological Service, Parque del Retiro, Apdo. 285, Madrid.

Learned societies, professional institutions and other associations

Agrupación Astronáutica Española [Spanish Astronautical Group], Avenida Generalisimo Franco 377, Barcelona. Belongs to IAF.

Agrupación Astronómica Aster [Astronomical Group], Paseo de Garcia 71, Barcelona 8.

Asociación Catalana de Medicina Aeronáutica y Espacial [Catalan Association of Aerospace Medicine], via Layetana 31, Barcelona 3. A section of the Medical Sciences Academy of Barcelona.

Asociación Española de Astronáutica [Spanish Astronautical Association], Serrano 43, Madrid. Belongs to IAF.

Asociación Española para el Progreso de las Ciencias [Spanish Association for the Development of Science], Calle de Valverde 24, Madrid.

Asociación de Ingenieros Aeronáuticos [Association of Aeronautical Engineers], General Goded 38, Madrid. A branch of the Spanish Institute of Civil Engineers.

Asociación de Ingenieros de Telecomunicación [Association of Telecommunications Engineers], General Goded 38, Madrid. A branch of the Spanish Institute of Civil Engineers.

Centro de Estudios Interplanetarios [Interplanetary Study Centre], Avda. José Antonio 755, 2A, Barcelona 13.

Instituto de Estudios Norteamericanos, Sección de Astronáutica [Institute of North American Studies, Astronautics Section], via Augusta 123, Barcelona 6.

Real Sociedad Española de Física y Química [Royal Spanish Society of Physics and Chemistry], Facultad de Ciencias, Ciudad Universitaria, Madrid.

Real Sociedad Matematica Española [Royal Spanish Society of Mathematics], Serrano 123, Madrid.

Sociedad Astronómico de España y América [Spanish and American Astronomical Society], Av. del Generalisimo Franco 377, Barcelona.

Sociedad Española de Medicina Aeronáutica y Cosmonáutica [Spanish Society of Aerospace Medicine], Villanueva 11, Madrid.

Sociedad Malagueña de Ciencias [Malaga Scientific Society], Rodriguez Rubí 3, Málaga.

Unión Nacional de Astronomía y Ciencias Afines [National Union of Astronomy and Related Sciences], Serrano 123, Madrid.

Government or official research establishments

Biblioteca Central del Ministerio del Aire [Central Library of the Air Ministry], Plaza de la Moncloa, Madrid : library of aeronautics, engineering, meteorology, chemistry and mathematics.

Centro Meteorológico de Baleares [Balearic Meteorological Centre], Calle Antonio Planas 23, Palma de Mallorca.

Instituto Nacional de Técnica Aeroespacial [National Institute of Aerospace Technology], Torrejón de Ardoz, Madrid. Includes Departments of Aerodynamics, Propulsion, Construction, Research and Advanced Studies ; serves as the aerospace research organization of the Air Ministry.

Instituto y Observatorio Astronómico de Marino [Astronomical Institute and Observatory of the Navy], San Fernando, Cadíz.

Madrid Astronomical Observatory, Calle de Alfonso XII 3, Madrid. Associated with the Instituto Geografico y Catastral.

Cartuja Observatory, Apdo. 32, Granada.

Ebro Observatory, Apdo. 9, Tortosa ; deals with solar physics, meteorology, seismology, terrestrial magnetism and ionospheric physics.

Universities and colleges

The Ministry for Foreign Affairs, Madrid, offers scholarships for completion of studies in Spain to graduate students from the Philippines and countries of Latin America, and to nationals of Islamic countries. Tenure is one academic year, at 5,000 pesetas monthly, plus other allowances.

Exchange scholarships in general subjects are offered to nationals of Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, Finland, France, Greece, India, Italy, Japan, Norway, the Netherlands, Pakistan, Turkey, the United Arab Republic and the United Kingdom for study in Spain. Tenure is one academic year in general, at 5,000 pesetas per month, plus other allowances.

Exchange studentships in fundamental sciences are offered to students from Belgium, Canada, the Federal Republic of Germany, France, the Netherlands, Switzerland and the United Kingdom.

Research scholarships are offered to British graduates with a working knowledge of Spanish, under a reciprocal arrangement between CSIC, Serrano 117, Madrid, and the British Council, State House, High Holborn, London, W.C.1. Tenure is ten months at 8,000 pesetas per month, plus tuition and travel.

Ayuntamiento de Barcelona [Barcelona Municipal Council] offers grants of 20,000 pesetas for study in Barcelona to graduate nationals of the Philippines and Venezuela.

Movimiento Internacional de Estudiantes pro Naciones Unidas, Comité Español [International Student Movement for the United Nations, Spanish Committee]. Apartado 208, Madrid, offers interchange studentships (10) to United Nations associations in other countries. Awards cover travel, lodging and maintenance expenses.

Barcelona University, Barcelona. Faculty of Science offers mathematics, physics, geodesy, astronomy, optics and celestial mechanics.

Colegio Mayor Universitario San Jorge, Maestro Nicolau 13, Barcelona 17, offers one-year university studentships to French and English students, male and at least 18 years of age, who will give some classes in their native language.

Granada University, Granada. Affiliated to the university is the Astronomical Observatory and Seismic Station of Cartuja.

Madrid University, Madrid. Faculty of Science offers mathematics, physics, atomic and nuclear physics, optics, geophysics, geodesy and astronomy. The Institute of Electricity and Automation offers studentships to Latin American graduates in science and engineering, for an international course on automation, automatic control and electronic computers. Tenure is seven months, covering both theory and practice, and the award is 6,000 pesetas per month, plus certain allowances. Affiliated to the university are the Escuela Especial de Ingenieros Aeronauticos [Specialist School of Aeronautical Engineering] and the Seminario de Astronomía y Geodesía [School of Astronomy and Geodesy], Ciudad Universitaria, Madrid. Exchange studentships in general subjects are available to students of Cologne University, Federal Republic of Germany.

Colegio Mayor Universitario de San Pablo, Isaac Peral 58, Madrid 9. Offers studentships for one year at Madrid University to nationals of all countries. Candidates must be male, not over 21 years of age, and of at least degree standard. Awards cover maintenance and lodging.

Santiago University, Compostela. Faculty of Science offers mathematics, physics, chemistry, mechanics, thermodynamics and astronomy.

Zaragoza University, Zaragoza. Faculty of Science offers mathematics, physics, chemistry, thermodynamics, optics and astronomy.

Sweden

National and State academies

Royal Swedish Academy of Science, Stockholm 50. Engaged in the promotion of mathematics and natural sciences. Awards the Nobel Prizes for physics and chemistry.

Awards offered to Swedish nationals for scientific research in any country include (*a*) L. J. Wallmark scholarship in mathematics, astronomy, mechanics, physics, chemistry, mineralogy or technology, of approximately 3,100 kronor per year, and (*b*) Jacob Letterstedt scholarship for a distinguished male scientist for advanced study abroad in science, technology or engineering; applicants should have knowledge of English, French or Latin and be aged between 25 and 40; tenure is six months minimum, at approximately 9,000 kronor.

Government departments and official agencies

Swedish Space Research Committee, Sveavägen 166, Stockholm Va. Sponsored by the Medical Research Council, the Natural Science Research Council, the Technical Research Council and the Research Institute of Swedish National Defence. The committee co-ordinates space research in Sweden.

Research Institute of Swedish National Defence, Lennégatan 89, Stockholm 80.

Space Technology Group, Box 1066, Solna 1. Formed to assist and advise the Space Research Committee and the Swedish Committee for ESRO in technical matters, to follow the general development of space technology, to help space scientists and to organize and conduct sounding rocket programmes; technical development work on ground and rocket-borne instrumentation is undertaken.

Medical Research Council, Sveavägen 166, Stockholm Va.

Natural Science Research Council, Sveavägen 166, Stockholm Va. Swedish government grants for basic research in mathematics and natural sciences are offered to Swedish nationals with sufficient scientific training for work in foreign laboratories.

Technical Research Council, Liljeholmsvägen 32, Stockholm Sv. Grants for technological and scientific research are available to Swedish or resident graduates in technology with practical experience; grants are also given for the invitation of foreign scientists and guest-lecturers to Sweden.

Swedish Meteorological and Hydrological Institute, P.O. Box 12108, Fridhemsgatan 9, Stockholm 12. The institute in affiliated to Stockholm University and is responsible for routine observations of meteorological data and weather forecasting; use is made of pictures received from weather satellites. Projects involving the use of rocket-borne instruments are planned in co-operation with ESRO and the Max Planck Institute, Heidelberg, and a laser experiment in co-operation with NASA is in progress.

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Swedish Agency for International Technical Assistance, Box 342, Stockholm 1. Scholarships and fellowships (approximately 100) are offered by the Government of Sweden to nationals of African, Asian and Latin American countries for participation in special courses and individual study programmes including medicine, technology and natural sciences. Awards are tenable mainly in Sweden but a limited number may be offered for study in other countries. Fellowships are for post-graduate study ; scholarships are for special under-graduate courses. On completion of study, recipients must return to their country. Tenure is one year maximum at 710 to 960 kronor plus tuition fees, books and other allowances.

Swedish Board of Telecommunications. In co-operation with the Danish and Norwegian boards of telecommunication, the board is using the newly built telescope at Råö, Gothenburg, for training engineers in the communication satellite field and other scientific work.

Swedish Institute for Cultural Relations with Foreign Countries, Kungagatan 42, Stockholm 3. Swedish government awards (45) for advanced study in Sweden are available to nationals of Argentina, Austria, Belgium, Brazil, Canada, Czechoslovakia, Denmark, the Federal Republic of Germany, Finland, France, Greece, Hungary, Iceland, Italy, Japan, the Netherlands, Norway, Peru, Poland, Spain, Switzerland, the USSR, the United Kingdom and Yugoslavia. Candidates who do not speak Swedish must have English, French or German. Tenure is eight months ; value, 5,600 kronor.

Learned societies, professional institutions and other associations

Gothenburg Royal Society of Science and Arts, Universitetsbiblioteket, Göteborg.

Academy of Engineering Sciences, Box 5073, Stockholm. Engaged in promotion of technological research.

Royal Society of Sciences at Uppsala, St. Larsgatan 1, Uppsala.

Lund Mathematical Society, Matematiska Institutionem, Lund.

Mathematical Society of the University of Uppsala, Uppsala.

Swedish Interplanetary Society, P.O. Box 5045, Stockholm 5. This is a private organization promoting space science and space technology by lectures and by publication of the periodical, *Astronautisk Revy*.

Foundations and trusts

Lund Academic Union, Lund. Awards are offered to students to enable them to study at other Scandinavian universities : (*a*) Danish Memorial Fund of Torgny Segerstedt open to Swedish students at the University of Lund, for study at the University of Copenhagen ; tenure three months ; value, 3,000 Danish kronor ; (*b*) Juel Westrup travel scholarships (2) for Swedish, Danish and Norwegian students at the Universities of Lund, Copenhagen and Oslo to study at other universities in Denmark, Norway and Sweden ; tenure three months ; value, 2,000 kronor ; (*c*) Oehlenschläger-Tegner travel scholarships (2) for Swedish and Danish students at the Universities of Lund and Copenhagen respectively.

Sweden-America Foundation, Grev Turegatan 14, Stockholm. Swedish government fellowships (4) are available to nationals of the United States of America and Canada for study at universities or other approved institutions in Sweden. Candidates must be graduates ; knowledge of Swedish preferable ; age-limit 35. Tenure is one academic year ; value, 5,850 kronor.

Swedish Students' International Scholarship Foundations, c/o Swedish National Union of Students, Aluddsvägen 7, Stockholm K. Scholarships are offered to nationals of African and Asian countries for under-graduate study in Sweden or possibly elsewhere, in natural sciences, technology or other fields. Candidates must be at university entrance level ; courses in some subjects are given in English ; otherwise tuition is in Swedish. Tenure is one year (renewable), and awards cover all expenses.

Government or official research establishments

Aeronautical Research Institute, Ranhammarsvagen 12, Box 11021, Bromma 11. Includes Departments of Aerodynamics, Structures, Physics and Engineering. Under jurisdiction of the Ministry of Defence.

Geodetic Institute, Hällby, Uppsala. Conducts satellite observation and prediction in co-operation with Slough, England ; Moscow, USSR and Helsinki, Finland.

Ionosphere Observatory, Lurbo, Uppsala. Conducts continuous registrations of the ionosphere, studies of D-region ion concentration and emission from released chemicals in twilight and aurora.

Kiruna Geophysical Observatory. An establishment of the Royal Swedish Academy of Science. One of the first ESRO satellites will be used for investigation of different types of ionizing radiation in the polar regions. The measurements of energy spectra of electrons and protons will be a joint undertaking between scientists in the Scandinavian countries and a group of scientists in Slough, England. Kiruna Geophysical Observatory is responsible for the Swedish part of this programme and will measure electrons of low energy (1 keV to 25 keV) and, if possible, protons of the same energy range. Instruments based on solid state detectors for measuring proton and electron spectra have been developed and are used in combined Danish-Norwegian-Swedish rocket experiments at Andoya, Norway. Similar instruments have been developed for the ESRO programme and will be used for auroral investigations. Other co-operative programmes involve NASA, United States of America, and the Max Planck Institute for Aeronomy in Lindau, Federal Republic of Germany. Data are received from satellites and are analysed in collaboration with Professor van Allen's group in Iowa, United States of America. The observatory offers to receive students under the ESRO fellowship programme ; there is also a joint satellite study group project sponsored by USAF Cambridge Research Centre, United States of America.

Lund Astronomical Observatory, Lund. Experiments to photograph the sun in Mg II light (2800 Å) from rockets have been carried out in co-operation with

NASA ; dust detectors are being constructed for ESRO experiments; solar magnetic field observations have been made in co-operation with the Crimean observatory.

Stiftelsen Wenner-Gren Centre for Scientific Research, Sveavägen 166, Stockholm Va. Has a residence and meeting place for foreign visiting scientists.

Stockholm Observatory, Saltsjöbaden. Engages in development of instruments for monochromatic photography of the solar disc and limbs in the Mg II lines, in co-operation with ESRO and NASA.

Uppsala Astronomical Observatory, Uppsala. Co-operative experiments with ESRO and NASA are in progress.

Industrial or commercial research organizations

Swedish Industry Group for Space Technology, c/o Dr. T. Gullstrand (Chairman), SAAB, Linköping: an association of industrial and manufacturing concerns.

Universities and colleges

Chalmers University of Technology, Sven Hultins Gata, Göteborg S. Offers mathematics, physics, mechanics, nuclear physics, thermodynamics, fluid dynamics, electron physics, vacuum and gas physics, nuclear chemistry and space science. The Institute for Theoretical Electron Physics offers vacancies under the European Universities Scheme. The Radio-Astronomical Observatory at Råö, Onsala, conducts normal radio-astronomy activities parallel with the tracking of satellites and deep space probes. A new telescope, 25 metres in diameter, is in operation. The telescope is to be used by the Scandinavian countries as a Scandinavian experimental ground station for experiments in telecommunication via satellites. The observatory offers to receive students under the ESRO fellowship programme.

Gothenburg University, Vasaparken, Göteborg C. Faculty of Science offers mathematics and physics.

Royal Caroline Institute, Solnavägen 1, Stockholm 60. Faculty of Medicine offers teaching and research in all branches of biomedicine ; awards the Nobel Prize for Physiology and Medicine. Many departments of the School of Medicine have facilities for teaching and research in basic subjects related to space biology and medicine. The Department of Aviation Medicine offers teaching and basic research in environmental physiology and medicine, application of systems analysis and control theory in physiology, biomedical engineering and other subjects related to bioastronautics.

Royal Institute of Technology, Stockholm 70. Offers mathematics, physics, mechanics, micro-wave engineering, plasma physics, hydromechanics, solid state physics, thermodynamics, aerodynamics, gas dynamics, automatic control, electron physics, electronics and telecommunications. The Division of Plasma Physics offers both theoretical and experimental studies of conditions in interplanetary and interstellar space. The division offers vacancies under the European Universities Scheme and under the ESRO fellowship programme. The Department of Aeronautical Engineering has a research centre at Styffevägen 45, Stockholm 70.

University of Lund, Lund 1. Faculty of Mathematics and Natural Sciences offers mathematics, physics, mechanics and astronomy; Physiology Institute offers aeromedical research. The astronomical observatory is planning rocket and satellite experiments with micrometeorite detectors. Experimental investigations of the solar magnetic field are being made in co-operation with USSR scientists at the Crimean Observatory.

University of Stockholm, Drottninggatan 116, Stockholm. Faculty of Natural Sciences offers mathematics, physics, meteorology and astronomy. Meteorological Institute conducts studies in upper atmosphere physics, particles in the upper atmosphere, noctilucent clouds, etc. Investigations of the nature and origin of noctilucent clouds have been carried out for a number of years and will be continued, with polarimetric measurements of the twilight sky. Laser techniques are used for determining height distribution and scattering properties of aerosol particles during both presence and absence of noctilucent clouds. The institute offers to receive students under the ESRO fellowship programme.

The Lund Institute of Technology, P.O. Box 725, Lund 7. Offers mathematics, mechanics, physics, nuclear physics, automatic control, thermodynamics, fluid dynamics and electronics.

University of Uppsala, Uppsala. Faculty of Science offers mathematics, physics, electricity, meteorology and astronomy. Physiological Institution conducts aeromedical research. Geodetic Institute, Astrogeodetic Observatory offers vacancies under the European Universities scheme. Institute of Physics engages in research on cosmic rays. Continuous registrations of the cosmic ray intensity have been carried out for ten years. The recording stations are situated in Uppsala and Kiruna. Evaluation of data is performed in co-operation with a cosmic ray group at the Royal Institute of Technology, Stockholm. The Institute of Physics offers to receive students under the ESRO fellowship programme. An international seminar for research and education in physics is sponsored by UNESCO.

Fellowships (15) are offered by the Swedish Agency for International Assistance to nationals of all countries, preferably developing countries, for study in the fields of experimental physics (mainly nuclear physics) ; also solid state physics, X-ray physics, plasma physics, electronics and C-14 dating. Candidates should possess a degree in physics from their countries of origin and are expected to continue university research and teaching upon return home after tenure of award : age 20 to 40. Tenure is for one academic year at 9,400 kronor, plus travel by air, maintenance, tuition, books, etc.

Fellowships and studentships : there are no Swedish scholarships specifically for fields directly related to the exploration of outer space, but certain scholarships are available for higher education in general technical and scientific fields for foreigners prepared to settle in Sweden.

Students from abroad undertaking study in Sweden can obtain information and/or practical help from the

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International Secretaries (Internationella Ombudsmannen) at the University of Uppsala, St. Johannesgatan 10, Uppsala ; University of Stockholm, Holländargatan 34, Stockholm ; and the University of Lund, Akademiska Föreningen, Lund.

General information concerning study in Sweden is available from the Swedish Institute for Cultural Relations with Foreign Countries, Kungsgatan 42, Stockholm C.

Information on fellowships and study grants for Swedish nationals and graduates of Swedish universities may be obtained in the UNESCO publication, *Study Abroad*. [41]

Switzerland

Government departments and official agencies

Commission pour l'encouragement des recherches scientifiques [Commission for the Encouragement of Scientific Research], rue Fédérale 8, Berne : a State commission to promote scientific research work.

Learned societies, professional institutions and other associations

Groupe d'études spatiales [Space Study Group], Observatoire de Genève, rue Charles-Galland, Geneva.

Commission for Space Research of the Swiss Scientific Society, c/o Professor E. Stiefel, President, Eidgenössische Technische Hochschule, Leonhardstrasse 33, 8006 Zurich.

Zurich Physics Society, Gloriastrasse 35, 8006 Zurich.

Swiss Working Group for Rocket Technology, Postfach 163, 9004 St. Gallen / Postfach 171, 8021 Zurich. This is an association for scientific and technological work in rocket propulsion and the dissemination of space knowledge.

Swiss Astronautical Working Group, Postfach 37, Baden.

Swiss Association of Aerospace Law, Bahnhofstrasse 30, 8001 Zurich.

Swiss Association for Space Technology, Plattenstrasse 28, 8032 Zurich. This is the principal organization for technological space research in Switzerland.

Foundations and trusts

Fondation Volkart, St. Georgenplatz 2, 8401 Winterthur. Study or research scholarships in Western Europe — preferably in Switzerland — and the United States, not necessarily in space subjects, are offered to Indian and Pakistan nationals, aged 22 to 30, with a master's or doctor's degree. Tenure is one to two years at 600 to 700 FS,[42] possibly plus travel grants. Applications to P.O. Box 199, 19 Graham Road, Ballard Estate, Bombay 1, India, or P.O. Box 4666, McLeod Road, Karachi, Pakistan.

Fonds national suisse de la recherche scientifique [Swiss National Foundation for Scientific Research], Wildhainweg 20, 3000 Berne. Research fellowships in fields including natural sciences and technology are offered to Swiss graduates and, exceptionally, to research workers of other nationalities attached to Swiss universities. Tenure is one to three years.

Institut Battelle, Centre de recherches de Genève [Battelle Institute Research Centre in Geneva], 7 route de Drize, Carouge, Case postale 1227, Geneva. Three fellowships are offered to European science graduates specially interested in research. Candidates must draft their own research programmes. Tenure two years, at 6,000 to 9,000 FS per year, plus other grants.

Société helvético-américaine de relations culturelles [Swiss-American Society for Cultural Relations], Zurich. A research fellowship in Switzerland, not necessarily in space subjects, is offered to a national of the United States. Tenure is one year, at 3,000 to 4,800 FS, and application should be made to the Institute of International Education, United States of America.

Swiss Friends of the United States of America, P.O. Box, Zurich 39. A scholarship for advanced studies at university or technological university, not necessarily in space subjects, is offered to a student from the United States of America. Tenure is one year, at 3,000 to 4,800 FS ; application should be made to the Institute of International Education, United States of America.

Government or official research establishments

Astrophysics Observatory, 7050 Arosa : a branch station of the Federal Astronomical Observatory in Zurich.

Jungfraujoch Scientific Station, Secretariat, Bühlplatz 5, Berne. This is an international foundation promoted by scientific institutions in Switzerland, Austria, Belgium, the Federal Republic of Germany, France, the Netherlands and the United Kingdom. Conducts high altitude research in astronomy, astrophysics, meteorology, cosmic rays and physiology.

Observatoire astronomique fédéral [Federal Astronomical Observatory], Schmelzbergstrasse 25, 8006 Zurich 6. Astronomy, solar activity. Branch stations are the Astrophysical Observatory, 7050 Arosa, and the Solar Observatory, 6605 Locarno-Monti.

Observatoire cantonal, Neuchâtel. Possesses library of 100,000 volumes.

Observatory of Geneva, rue Charles-Galland, Geneva.

Swiss Central Meteorological Station, Krähbühlstrasse 58, 8044 Zurich.

Solar Section of the Federal Astronomical Observatory, 6605 Locarno-Monti.

[41] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[42] Swiss francs.

UNIVERSITIES AND COLLEGES

Federal Institute of Technology (ETH), Leonhardstrasse 33, 8006 Zurich. Offers mathematics, physics, mechanics, electronics, automatic control, telecommunications, atmospheric physics, nuclear physics, geophysics and astronomy. There is also an Aerodynamics Institute, Sonneggstrasse 3, Zurich; a Thermodynamics and Combustion Engines Institute, Sonneggstrasse 3, Zurich; a High Frequency Techniques Institute, Physikgebäude, Sternwartstrasse 7, Zurich, and an Applied Mathematics Institute which conducts research in celestial mechanics. Exchange scholarships are offered for studies in fields including engineering, science, chemistry, mathematics, physics and the natural sciences, to nationals of Canada, the Federal Republic of Germany, France, Italy, South Africa, Spain, Sweden, the United Kingdom and the United States of America. Candidates should be aged 22 to 30, have completed some years of university study and be fluent in German. Tenure is one year, at 4,500 to 5,000 FS plus tuition fees.

Basel University, Petersplatz 1, Basel. Faculty of Science offers mathematics, physics, chemistry and astronomy. Scholarships for study at the university include one each for French and Italian nationals and three exchange scholarships for United States nationals; applications should be made to the Institute of International Education in the United States of America. Tenure is one year, at 5,000 FS, plus tuition fees.

Bern University, Bern. Faculty of Pure Science offers mathematics, physics, chemistry and astronomy. One exchange scholarship each is offered for students from Austria, the Federal Republic of Germany, France, Italy and the United States of America; tenure is one year at 4,500 FS, plus tuition fees.

Geneva University, rue de Candolle 3, Geneva. Faculty of Science offers mathematics, physics, chemistry, nuclear physics, spectroscopy, astrophysics, astronomy, mechanics and electronics. The university offers exchange scholarships (11) to graduate students with aptitude for independent work from Austria, the Federal Republic of Germany, France, Italy, Poland, Spain, the USSR, the United Kingdom and the United States of America. Tenure is one year, at 4,500 FS, plus tuition fees.

Lausanne University, Lausanne: École Polytechnique [Polytechnic Institute], 33 ave. de Cour, Lausanne.

Zurich University, Zurich. Faculty of Philosophy II offers physics, mathematics, chemistry and astronomy. The university offers exchange scholarships, usually one or two per country, to nationals of Austria, the Federal Republic of Germany, France, Italy, the Netherlands, Spain, the United Kingdom, the United States of America and the Scandinavian countries. Tenure is generally one year at 4,800 FS, plus fees in certain cases. Application should be made to the candidate's university, except in certain cases listed in the UNESCO publication, *Study Abroad*.[43]

Fellowships (100) for advanced study, not specifically in space subjects, at Swiss universities are offered by the Federal Department of the Interior, Palais fédéral, Berne, for students from other countries. Tenure is one year, at 6,000 to 12,000 FS, and application should be made to the Swiss diplomatic representative in the candidate's country. Canton de Bâle-Ville, Commission des Bourses, Münsterplatz 1, Basel, offers scholarships to nationals of developing countries having a good knowledge of German. Tenure is for one or more semesters, at 450 to 700 FS per month, plus tuition fees. Further information is obtainable from Office central universitaire suisse, Beckenhofstrasse 31, 8006 Zurich. The directory *University Education in Switzerland*, published in German, English, Spanish and French, may be obtained free from Office suisse du tourisme, Bahnhofplatz 9, 8001 Zurich.

Information on fellowships and study grants for Swiss nationals and graduates of Swiss universities may be obtained in the UNESCO publication, *Study Abroad*.[43a]

Thailand

NATIONAL AND STATE ACADEMIES

Royal Institute, Bangkok: an institute of arts and sciences.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Applied Science Research Organization, Bangkok. Modelled on the Commonwealth Scientific and Industrial Research Organization of Australia.

UNIVERSITIES AND COLLEGES

Chulalongkorn University, Phya Thai Road, Bangkok. Includes Faculties of Science and Engineering.

Civil Aviation Training Centre, Bangkok. Established by ICAO for the training of all types of aviation personnel and also aeronautical meteorological personnel, as a Special Fund project. WMO collaborated and on completion of the Special Fund project took over responsibility for meteorological training in the centre, incorporating it in the WMO/Special Fund project in Thailand for the expansion of meteorological services. The centre gives theoretical instruction and practical training up to junior meteorologist level, in a sixteen-month course. Entrance qualifications include experience in weather observation and a knowledge of mathematics and physics, preferably equivalent to a completed first year at a university.

SEATO Graduate School of Engineering, Bangkok. Open to graduates from all South-East Asian countries and to a limited number from other countries. The two-year course leads to the degree of M.Eng.

Thai government fellowships (6) are available to graduates of all countries, including Non-Self-Governing Territories, for study in Thailand in fields including science and engineering; tenure is one year and the maximum award 14,000 bahts.

Government scholarships are offered to nationals of Burma, Cambodia, Ceylon, India, Indonesia, Laos,

[43] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[43a] *Ibid.*

Malaysia, Pakistan, the Philippines and the Republic of Korea who have a knowledge of Thai and English. Candidates must be educated to Thai university entrance standard; age limit 30 years. Tenure is 3 to 6 years, at 12,000 bahts per year.

Colombo Plan scholarships and training awards for study in Thailand are available to nationals of Australia, Brunei, Burma, Cambodia, Ceylon, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the Philippines and the Republic of Viet-Nam. Candidates must be nominated by the appropriate government department in their countries.

Tunisia

Universities and colleges

École de l'aviation civile et de la météorologie [School of Civil Aviation and Meteorology], B.P. 25, El-Aouina, Tunis. This centre was established in 1958, with assistance from WMO. Two WMO instructors were assigned to provide meteorological training; one of these has since completed his assignment. Courses are given for meteorological assistants (twelve months) and observers (nine months). Educational requirements for admission to observers' courses are nine to ten years' primary and secondary education; for assistants' courses, twelve years' education.

Tunis University, 94 boulevard du 9 Avril 1938, Tunis. Includes Faculty of Mathematics, Physics and Natural Sciences. Attached research institutes include the Institute of Atomic Physics.

The Government, through the Secretariat for National Education, Tunis, offers 5 scholarships for higher education to students from developing countries; tenure is ten months, at 250 dinars, plus tuition and a travel allowance.

Scholarships under the United Nations programme are offered to students from Trust Territories, Non-Self-Governing Territories and South West Africa for secondary or higher education in Tunisia. Tenure is one year, and awards cover travel, maintenance, and 250 F per month for university students.

Turkey

Government departments and official agencies

Directorate-General of the Meteorological Service, P.O. Box 401, Ankara.

Universities and colleges

University of Ankara, Ankara; Fen Fakultesi, Institute of Astronomical Sciences, Mebus Evleri, Ankara.

Istanbul University, Bayezit, Istanbul. Faculty of Science offers astronomy.

The Ministry of National Education, Ankara, offers grants for study in Turkey to nationals of Afghanistan, Algeria, Austria, Belgium, China, Cyprus, Denmark, Ethiopia, Finland, France, Greece, India, Indonesia, Iran, Iraq, Israel, Italy, Japan, Lebanon, Libya, Morocco, the Netherlands, Nigeria, Norway, Pakistan, the Republic of Korea, Spain, Sudan, Sweden, Switzerland, Syria, Tunisia, the United Kingdom and the United States of America. Candidates must satisfy university entrance requirements. Tenure is eight months (renewable) and awards cover maintenance, fees and some other expenses.

Scholarships under the United Nations programme are offered to students from Trust Territories and Non-Self-Governing Territories, to enable them to study at universities or to obtain technological and professional training in Turkey. Tenure is for the duration of studies, plus one year for study of the language; the value of the award varies according to the level of studies.

Union of Soviet Socialist Republics

National and State academies

Academy of Sciences of the USSR, Leninsky Prospekt, Moscow. Includes members representing astronomy, astrophysics, automation, geophysics, hydrodynamics, mathematics and physics. Periodicals published by the academy include the following:

"Journals of Abstracts, Astronomy and Geodesy" (monthly);

"Astronomy Journal" (six times yearly);

"Geomagnetism and Aeronomics" (six times yearly).

Exchange fellowships for scientific research, under a reciprocal scheme between the USSR and French Governments, are offered to French research workers of the Centre national de la recherche scientifique with proven ability.

Academy of Sciences of the Armenian SSR, Erevan. Department of Physical and Mathematical Sciences includes the Byurakan Astrophysical Observatory.

Academy of Sciences of the Azerbaijanian SSR, Baku. Department of Physical and Technical Sciences includes an Astrophysical Observatory.

Academy of Sciences of the Estonian SSR, Tallinn. Department of Physics, Mathematics and Technical Sciences includes the Institute of Physics and Astronomy and the Tartu Astronomical and Geophysical Observatory.

Academy of Sciences of the Kazakh SSR, Alma-Ata. Department of Cosmology and Geology includes the Institute of Astrophysics and a section on the ionosphere.

Academy of Sciences of the Latvian SSR, Riga. Department of Physical and Technical Sciences includes a laboratory of astrophysics.

Academy of Sciences of the Tajik SSR, Dushanbe. Department of Physics, Chemistry and Technical Sciences includes the Institute of Astrophysics.

Academy of Sciences of the Ukranian SSR, Kiev. Department of Physical and Mathematical Sciences includes the Central Astronomical Observatory.

Academy of Sciences of the Uzbek SSR, Tashkent. Department of Physical and Mathematical Sciences includes the Tashkent Astronomical Observatory.

Government departments and official agencies

Commission on Exploration and Use of Outer Space of the Academy of Sciences of the USSR, Moscow, represents the Soviet Union on COSPAR international space programmes, IAF etc.

Foundations and trusts

All-Union Central Council of Trade Unions, 42 Leninsky Prospekt, Moscow. Offers scholarships to students from developing countries, on conditions comparable for government awards.

Committee of Youth Organizations of the USSR, 7-8 Ul. B. Khmelnitskovo, Moscow. Offers approximately 100 scholarships to young people from developing countries for undergraduate study in the USSR. Conditions are as for the government awards.

Soviet Afro-Asian Solidarity Committee, 10 Kropotkinskaya Ul., Moscow. Offers scholarships for study in the USSR to nationals of African and Asian countries. Applications should be made to the National Committee for Afro-Asian Solidarity in the candidate's country.

Union of Soviet Societies for Friendship and Cultural Relations with Foreign Countries, 14 Prospekt Kalinina, Moscow. Offers scholarships to nationals of African, Asian and Latin American countries, with awards covering travel expenses to and from the USSR.

Government or official research establishments

All-Union Mendeleev Meteorological Research Institute, Moskovski Prospekt 19, Leningrad L-5.

Central Aerological Observatory, Dolgoprudnaya, Moscow.

Central Chkalov Aviation and Astronautics Museum, Moscow.

Department of Economics, Philosophy and Law of the Academy of the USSR, Kitaisky Proyezd 7, Moscow ; includes the Commission on Legal Questions of Outer Space, Ul. Frunze 10, Moscow.

Department of Physics and Mathematics of the Academy of Sciences of the USSR, Leninsky Prospekt 14, Moscow. Includes the following institutes :

Institute of Theoretical Astronomy, Mendeleevskaya Liniya 1, Leningrad ;

Institute of Atmospheric Physics and Commission on Atmospheric Physics, Bolshaya Gruzinskaya 10, Moscow ;

Crimean Astrophysical Observatory, Crimea ;

Central Astronomical Observatory, Pulkovo, near Leningrad ;

Council for Astronomy, Bolshaya Gruzinskaya 10, Moscow ;

Committee on Meteorites, Ul. Ossipenko 52, Moscow ;

All-Union Astronomical and Geodetical Society, pocht. yashch. 1268, Moscow 9 ;

Institute of the Earth's Magnetism, the Ionosphere and the Spreading of Radio Waves, Vatutinki, Polosk Raion, Moscow Oblast ;

Commission on Interplanetary Communication, Bolshaya Gruzinskaya 10, Moscow ;

International Space Tracking Training Centre, Tashkent ;

Leningrad Hydrometeorological Institute, Malo-Okhtensky Prospekt 98, Leningrad K-196 ;

Odessa Hydrometeorological Institute, Ul. Kirova 106, Odessa, Ukrainian SSR ;

Planetarium, Sadovaya-Kudrinskaya 5, Moscow.

Universities and colleges

A very large number of universities and other higher educational institutes provide courses in the basic subjects related to the peaceful uses of outer space.

All foreign nationals studying at institutions of higher education or specialized secondary education in the USSR receive scholarships from the Soviet Government. About 15,000 awards are made each year. Fields of study in science and technology include geology, radio engineering and communications, hydrology and meteorology, geodesy and cartography. For admission to undergraduate courses at universities and technical institutions (five to six years), age limits are 17 to 35 ; for postgraduate courses (three to four years), up to 40 years of age. Advanced training or refresher courses (one or two years) in various disciplines are open to specialists and teachers who have completed their higher education, without age limit. Monthly allowances are 90 roubles for undergraduates, 100 for persons engaged in postgraduate work and 150 for advanced trainees, with free tuition and certain other assistance.

The Ministry of Higher and Secondary Education, Moscow, offers scholarships under the United Nations programme to students from Non-Self-Governing and Trust Territories, South West Africa and territories under Portuguese administration for study and training in the USSR. Fellowships under UNESCO programmes are offered for the training of African university staff and for the advanced training of Latin American university teaching and research staff. Fellowships under the programme of the United Nations Economic Commission for Asia and the Far East (ECAFE) are open to nationals of Afghanistan, Burma, Cambodia, Ceylon, India, Indonesia, Laos, Malaysia, Nepal, Pakistan, the Philippines and Thailand.

Scholarships on the basis of inter-governmental exchange agreements are open to nationals of Afghanistan, Albania, Bulgaria, Burma, Cambodia, Ceylon, China, Denmark, Finland, France, Germany, Guinea, Hungary, India, Indonesia, Iraq, Italy, Korea, Lebanon, Mongolia, Nepal, Norway, Poland, the Republic of Viet-Nam, Romania, Spain, Sudan, Sweden, the United Arab Republic, the United States of America and Yugoslavia. Studentships (22) are available to graduate nationals of the United Kingdom engaged in university study or research ; age under 35 years, with a working knowledge

of Russian; tenure is one academic year, covering maintenance and tuition, low-cost accommodation being available and travel paid by the British Council.

Exchanges for scientific and technological personnel, university staff and graduate students have been agreed with the British Council, 65 Davies Street, London W.1.

Byelorussian V. I. Lenin State University, University City, Minsk. Includes Faculties of Physics and Mathematics, Biology and Chemistry. This university is open to students from abroad.

Central Asian V. I. Lenin State University, Ul. K. Marxa 32, Tashkent. Includes Faculties of Physics and Mathematics, Biology, Geology and Soil Science. This university is open to students from abroad.

Erevan State University, Ul. Aboryana 104, Erevan. Includes Faculties of Physics and Mathematics, Chemistry, Biology, Geology and Law.

Irkutsk V. A. Zhdanov State University, Bulvar Gagarina 20, Irkutsk. Includes Faculties of Physics and Mathematics, Chemistry, Biology and Radiophysics. This university is open to students from abroad.

Kharkov A. M. Gorky State University, Ploshchad Dzerzhinskogo 4, Kharkov, Ukrainian SSR. Includes Faculties of Physics and Mathematics, Biology, Geology, Chemistry and Radiophysics. This university is open to students from abroad.

Kiev I. G. Shevchenko State University, Vladimirskaya 64, Kiev. Possesses an associated Astronomical Observatory; also Faculties of Mechanics and Physics, Mathematics, Radiophysics, Chemistry, Biology and Law. This university is open to students from abroad.

Leningrad A. A. Zhdanov State University (Order of Lenin), Universitetskaya Nab. 7/9, Leningrad. Subjects offered in the Faculty of Mathematics and Mechanics include theoretical astronomy, stellar astronomy, astrophysics, mechanics, elasticity and hydroaeromechanics. Subjects offered in the Faculty of Physics include physics of the atmosphere, electrophysics, nuclear physics, quantum mechanics and optics. This university is open to students from abroad.

Lvov Ivan Franko State University, Ul. Universitetskaya 1, Lvov, Ukrainian SSR. Includes Faculties of Physics, Mathematics and Mechanics, Biology and Chemistry. This university is open to students from abroad.

Moscow M. V. Lomonosov State University (Order of Lenin), Leninskie Gory, Moscow 5. Faculty of Physics offers physics of the atmosphere, celestial mechanics, gravimetry, stellar astronomy, astronomy, astrophysics, cosmic rays, atomic physics, quantum theory, electronics, magnetism, cryogenics and optics. There is an associated Institute of Astronomy. This university is open to students from abroad.

Novosibirsk State University, Academgorodok, Novosibirsk, Siberia. Includes Faculties of Mechanics and Mathematics, Physics, Natural Sciences and Geophysics.

Odessa I. I. Mechnikov State University, Ul. Shchepkina 12, Odessa, Ukrainian SSR. Includes Faculties of Physics and Mathematics, Biology and Chemistry. This university is open to students from abroad.

Patrice Lumumba People's Friendship University, 5 Donskoy Proyesd, 7, Moscow. Includes Faculties of Physics, Mathematical and Natural Sciences, Law, Medicine and Engineering; also a Preparatory Faculty. This university is open to students from abroad, and makes fellowships and studentships available to foreign nationals from developing countries in Africa, Asia and Latin America. Admission is decided by entrance examinations; age under 35. Awards cover travel to and from the USSR at 90 roubles per month, plus other allowances.

N. E. Zhukhovsky Air Force Engineering Academy, Prospekt Leningrad 40, Moscow D-167.

Polytechnic institutes admitting students from abroad are:

Donetsk Polytechnic Institute, Ul. Artema 58, Donetsk, Ukrainian SSR;

Erevan Karl Marx Polytechnic, Ul. Teryana 105, Erevan, Armenian SSR;

Irkutsk Polytechnic Institute, Ul. Lermontova 83, Irkutsk;

Kharkov Polytechnic Institute, Ul. Frunze 21, Kharkov, Ukrainian SSR;

Kiev Polytechnic, Brest-Litovsky Prospekt 39, Kiev, Ukrainian SSR;

Krasnodar Polytechnic Institute, Krasnaya 135, Krasnodar;

Leningrad M. I. Kalinin Polytechnic Institute, Politekhnicheskaya Ul. 29, Leningrad K-64;

Lvov Polytechnic, Ul. Mira 12, Lvov, Ukrainian SSR;

Byelorussian Polytechnic, Lenin Prospekt 93, Minsk, Byelorussian SSR;

Odessa Polytechnic, Novo Arkadieuskaya Ul. 1, Odessa, Ukrainian SSR;

Tashkent Polytechnic Institute, Ul. Yakuba 16, Tashkent;

Urals S. M. Kirov Polytechnic, Vtuzgorodok, Sverdlovsk.

United Arab Republic

Government departments and official agencies

Department of Meteorology, War Ministry, Cairo.

Egyptian Space Research Committee.

National Research Centre, al-Tahrir Street, Dokki, Cairo. Promotes and conducts research in pure and applied sciences. Its laboratories are organized in departments including physics, chemistry and chemical technology and earth science. The Scientific Instruments Division includes electrical and electronic instruments, precision mechanics and optical instruments. The Supreme Council of Scientific Research in the United Arab Republic has an agreement with the Academy of Sciences of the USSR on a co-operative programme of photographic tracking of artificial satellites and space objects. Workers from other countries may be invited to take part in the programme and research studies based on observations taken in the United Arab Republic and the USSR may be published.

Equipment for the programme, presented by the Academy of Sciences of the USSR, is under erection in Helwan observatory, 30 km south of Cairo. The Supreme Council of Scientific Research has expressed its willingness to foster the existing co-operative programmes with Greenwich and Manchester in the United Kingdom and the Academy of Sciences of the USSR, by exchange of workers, to invite workers from other countries to co-operate, and to delegate scientists to laboratories in other countries for reduction of observations taken by the Kottamia telescope during the total lunar eclipse of 19 December 1964, on differential temperature of the moon's surface.

Supreme Council of Scientific Research. Co-ordinates the national scientific programme and controls the National Research Centre.

Learned societies, professional institutions and other associations

Egyptian Astronautical Society, 1, Sh. Klhamy, Cairo.

Government or official research establishments

Electronics Research Institute, Dokki, Cairo. Comes within the purview of the National Research Centre. The institute conducts basic research in electronics and applications in mathematics and telecommunications including space communications, telemetry and ionospheric research. It is planned to provide the necessary laboratory equipment and scholarships for the training of engineers and scientists.

Meteorological Institute for Research and Training, Cairo (see international organizations of the United Nations system).

The observatories, head office, Helwan, Cairo, comprising the Helwan Observatory (74-inch telescope engaged in photographic and photometric observations of the moon jointly with Manchester), the Kottamia Observatory and the Magnetic Observatory at Fayyoum, carry out research in geophysics, astronomy and meteorology. Good accommodation is available and the United Arab Republic welcomes workers from other countries on space research on a co-operative basis.

Universities and colleges

The Ministry of Foreign Cultural Relations, 2 Darih Saad Street, Cairo, offers scholarships to nationals of most countries, particularly Arab, African and Asian countries, for study at schools, colleges or universities in the United Arab Republic. Tenure is one year at £130 [44] to £390.

Scholarships under the United Nations programme are available to students from Non-Self-Governing Territories, South West Africa, and territories under Portuguese administration, for study at schools or universities in the United Arab Republic. Awards are usually for one year (renewable) and cover maintenance, tuition and travel.

[44] The currency referred to in this section is the Egyptian pound.

The Ministry of Scientific Research, Cairo, offers studentships (50) to nationals of African countries for scientific or technical research in the United Arab Republic. Previous experience is preferable; age under 40. Tenure is six months, and awards cover travel, tuition and certain other allowances.

Ain Shams University, Kasr-el-Zaafran, Abbasiyah, Cairo. Faculty of Engineering offers physics and geophysics, radio engineering and electronics; Faculty of Science offers optical spectroscopy, relativity.

Cairo University, Orman Ghiza, Cairo. Faculty of Law offers a course in aerospace law; Faculty of Science offers astronomy.

United Kingdom

National and State academies

The Royal Society, Burlington House, London, W.1. This is a society of eminent scientists and engineers formed for the promotion of natural knowledge; it represents the United Kingdom on COSPAR.

Royal Society and Nuffield Foundation Commonwealth bursaries are available to Commonwealth scientists of proven ability to enable them to pursue research, learn techniques or undertake other forms of study in natural sciences in other parts of the Commonwealth; not for preparation for higher degrees. Tenure is two to twelve months, and the value between £200 and £600 per year in the United Kingdom and equivalent rates elsewhere, plus transport.

A Rutherford scholarship is available to nationals of the Commonwealth for the study of natural sciences, preferably experimental physics, in some part of the Commonwealth other than that in which the applicant graduated; age under 26, or 28 if holding Ph.D. degree. Tenure is three years at £800 to £1,050 per year (or up to £1,250 for post-doctoral candidates), plus transport, fees etc.

A Mackinnon reseach studentship for furthering original research in the physical sciences, including chemistry, geophysics, astronomy and engineering, is available to graduates of all countries, tenable in any country, for two years (renewable) at £1,300 to £1,500 and exceptionally £1,700.

The Royal Society of Edinburgh, 22/24 George Street, Edinburgh 2. Founded for the promotion of science and literature; possesses a scientific library of 150,000 volumes.

Government departments and official agencies

Aeronautical Research Council, National Physical Laboratory, Teddington, Middlesex: an official co-ordinating body for research in government establishments and universities.

Board of Trade, 1 Victoria Street, London, S.W.1. Athlone fellowships (41) are available to Canadian or British graduates in engineering from Canadian universities, for study at universities or colleges in the United Kingdom or for training in approved industrial organi-

zations. Tenure is two years maximum, at £618, plus travel and tuition.

British National Committee on Space Research, c/o The Royal Society, Burlington House, London, W.1. Co-ordinates research in government establishments and universities, and co-operates with COSPAR.

Council for Technical Education and Training for Overseas Countries, Eland House, Stag Place, Victoria, London, S.W.1. The purpose of this government foundation is to intensify British assistance, non-governmental as well as governmental, in technical education and training for overseas countries ; recruits qualified staff for overseas appointments.

General Post Office. The government department conducting and co-ordinating United Kingdom participation in communications satellites experiments and in the International Communications Satellite Consortium. Operates the Goonhilly Down ground station, for the amplification and retransmission of communications signals between the United Kingdom and the United States of America.

Meteorological Office, London Road, Bracknell, Berkshire : a government institution. Adequately qualified foreign students might be able to obtain training in space research by attachment to the research groups at this establishment, whose activities in geophysics and optics are included in the Royal Society's report to COSPAR.

Ministry of Aviation. Conducts research and development activities in satellite engineering and launch vehicles and weather research. Responsible for United Kingdom participation in the ELDO project.

Ministry of Overseas Development, Eland House, Stag Place, Victoria, London, S.W.1. Under the Technical Co-operation Scheme of the Special Commonwealth African Assistance Plan, scholarships and training awards (approximately 1,700) for study in the United Kingdom in subjects making a direct contribution to the economic development of the recipient's country are available to nationals of Basutoland, Bechuanaland, Gambia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Sierra Leone, Rhodesia, Swaziland, Uganda, the United Republic of Tanzania and Zambia. Tenure is three months to three years, at £480 to £744 plus travel, tuition, maintenance, books and clothing allowances.

Similar grants are available under technical assistance for non-Commonwealth Africa to nationals of other African countries.

Similar grants are available under the Colombo Plan to nationals of countries participating in the Colombo Plan (Afghanistan, Bhutan, Burma, Cambodia, Ceylon, India, Indonesia, Laos, Malaysia, the Maldive Islands, Nepal, Pakistan, the Philippines, the Republic of Korea, the Republic of Viet-Nam and Thailand).

Similar grants are available under the Technical Co-operation Scheme for the Caribbean, for Latin America, for Middle East non-CENTO countries (Cyprus, Iraq, Jordan, Lebanon and Syria), for Iran, Pakistan and Turkey, and for Mauritius, New Hebrides, Seychelles, the Solomon Islands and Tonga.

Ministry of Technology, Millbank Tower, Millbank, London, S.W.1. This government department is generally responsible for guiding and stimulating advances in technological research. The Ministry has ten research establishments and gives support to fifty industrial research associations.

Science Research Council of the Department of Education and Science, State House, High Holborn, London, W.C.1. Supports research in fundamental science, engineering and technology in its own establishments and in universities, encourages and supports similar research by others, co-ordinates British participation in CERN and ESRO, provides and operates equipment for common use by universities and colleges, awards grants for postgraduate study courses and research.

Establishments for which the council is responsible include the Royal Greenwich Observatory, the Royal Observatory in Edinburgh, the Radio Research Station at Slough, the Rutherford High Energy Laboratory at Didcot, the Atlas Computer Laboratory at Didcot and the Nuclear Physics Laboratory at Daresbury, Astronomy, Space and Radio Division.

Science Research Council research awards in science and technology for British subjects normally resident in the United Kingdom include fellowships for candidates normally at doctorate level and studentships for candidates with a good university honours degree.

Space Policy and Grants Committee. This is a government policy advisory committee of the Astronomy, Space and Radio Division of the Science Research Council and the principal point of contact for NASA on policy matters.

Space Research Management Unit, 3 Chester Gate, London, N.W.1., a unit of the Astronomy, Space and Radio Division of the Science Research Council. Directs the management of United Kingdom non-military space research activities, and is the principal point of contact for NASA on operational matters.

United Kingdom Atomic Energy Authority, 11 Charles II Street, London, S.W.1. Responsible for research and development in atomic energy ; research group at the Atomic Energy Research Establishment, Harwell, near Didcot, Berkshire.

Adequately qualified foreign students might be able to obtain training in space research by attachment to the research groups at the Culham Laboratory, the centre for nuclear fusion and plasma physics research, whose activities in astronomy, geophysics and optics are included in the Royal Society's report to COSPAR.

Learned Societies, Professional Institutions and Other Associations

Association for Science Education, 52 Bateman Street, Cambridge. Aim : to improve science teaching and provide a medium of expression for science teachers.

British Association for the Advancement of Science, 3 Sanctuary Buildings, 20 Great Smith Street, London, S.W.1. Activities have included the promotion of space science lectures.

British Interplanetary Society, 12 Bessborough Gardens, London, S.W.1. Aim : to promote space research

and technology by the study of appropriate subjects, such as astronomy, rocket technology and electronics. Education working group has published teachers' handbooks, pamphlets, etc. The Golovine award has been established to encourage interest in astronautics among young people.

Federation of British Industries, 21 Tothill Street, London, S.W.1. Overseas scholarships for practical training in any branch of engineering are available to graduate engineers from Commonwealth countries (except Canada) and certain other countries in early stages of industrial development.

Institute of Physics and the Physical Society, 47 Belgrave Square, London, S.W.1. Aim : to advance and diffuse a knowledge of physics, pure and applied.

Institution of Electrical Engineers, Savoy Place, London, W.C.2. Aim : to promote the general advancement of electrical science and engineering and their applications.

Institution of Electronic and Radio Engineers, 8/9 Bedford Square, London, W.C.1. Aim : to promote the advancement of the science of radio and electronic engineering and applications.

Institution of Electronics, Pennine House, 78 Shaw Road, Rochdale, Lancashire. Established for the furtherance of the science of electronics and other scientific subjects.

Royal Aeronautical Society, 4 Hamilton Place, London, W.1. Astronautics and Guided Flight Section. Charter scholarship, Edward Busk studentship and Geoffrey de Havilland memorial scholarships (3) are available to nationals of Commonwealth countries who have been accepted for postgraduate courses in aeronautical engineering in the United Kingdom. Tenure is one year, and amount of award £50, which may be increased in certain cases.

Royal Astronomical Society, Burlington House, London, W.1.

Royal Institute of Chemistry, 30 Russell Square, London, W.C.1.

Royal Institution of Great Britain, 21 Albemarle Street, London, W.1. Established for the promotion of science and the extension of useful knowledge. Organizes courses for members, for schools and for juveniles. Possesses research laboratories.

Royal Meteorological Society, 49 Cromwell Road, London, S.W.7. Aim : to promote the science of meteorology.

Society of British Aerospace Companies, 29 King Street, St. James's, London, S.W.1, Education Committee.

Foundations and trusts

British Council, 65 Davies Street, London, W.1. Aim : development of closer cultural relations with other countries. Funds are derived mostly from government departments. In recent years, the Council has increasingly concentrated on educational work in developing countries in Asia and Africa ; activities include the exchange of knowledge and information between scientists in Britain and other countries. Many services are performed for overseas students in Britain, including programmes of studies, short courses and summer schools. General advice and information on study in the United Kingdom is available.

Scholarships (approximately 500) open to university graduates or candidates of equivalent status, for study in the United Kingdom, are available to nationals of most countries except the United States of America ; age preferably 25 to 35. Tenure is for one or two years, at £500 to £565, plus fees, book allowance and travel. Recipients must return to their own country on completion of studies.

Short-term bursaries (approximately 500) in any industry or profession, for candidates from most countries except the United States of America, who are fully qualified in their profession, have a tenure of three to six months, covering maintenance, fees and, in exceptional cases only, travel. Recipients must return to their own country on completion.

British Council travel grants for the promotion of university interchange between the United Kingdom and Commonwealth countries, are available to university teachers in recognized study leave with pay (usually for a minimum of six months) ; distinguished scholars invited by universities for short visits (usually for a minimum of six weeks), and postgraduate university research workers holding research grants (usually for a minimum of six months).

British Council travel grants for the promotion of university interchange between the United Kingdom and South Africa are available to university teachers on recognized study leave and to postgraduate university research workers holding research grants. Tenure is usually a minimum of six months, at £210.

Ciba Foundation, 41 Portland Place, London, W.1. Aim : to advance and promote study and research in chemistry, medicine and biology, and in particular to promote international co-operation in medical and chemical research.

Commonwealth Scholarship Commission, Marlborough House, Pall Mall, London, S.W.1. Under the Commonwealth Scholarship and Fellowship Plan, 225 scholarships for study in the United Kingdom at universities, colleges of technology and other institutions of higher learning are offered to Commonwealth citizens domiciled in a country other than the United Kingdom. Candidates must be graduates or equivalent, age limit 35 and preference given to those between 22 and 28. Awards are mainly for advanced study and research. Tenure is normally two years, and the award covers tuition, maintenance at £56 10s. per month with, under certain circumstances, marriage and children's allowances, plus travel expenses.

English-Speaking Union of the Commonwealth, Dartmouth House, 37 Charles Street, Berkeley Square, London, W.1. Works closely with the English-Speaking Union of the United States. Conducts extensive educational activities, including student and teacher exchange.

Goldsmiths' Company, Goldsmiths' Hall, Foster Lane, Cheapside, London, E.C.2. Makes grants for educational purposes : fellowships in applied science, travelling

fellowships, university studentships for postgraduate study at African colleges and universities.

Marshall Commemoration Commission, 36 Gordon Square, London, W.C.1. Marshall scholarships (24) are available to nationals of the United States of America, of graduate status, age limit 26, or exceptionally 28, for study for a degree at a British university. The awards are given as a demonstration of gratitude to the United States Government and people for the European Recovery Programme. Tenure is two years (renewable) at £625 per year plus travel, tuition, book and possibly marriage allowances.

Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1. Travelling fellowships are available to nationals of certain countries to enable them to pursue advanced studies in the United Kingdom in subjects to be decided each year. Candidates must be of Ph.D. status with outstanding research ability and at least one year's teaching or research experience on the staff of a university or similar institution : age normally 25 to 35. Tenure is one year at £1,440 to £1,800, plus travel.

Countries are Ceylon, India (engineering, natural sciences and medical sciences), Australia (medicine and natural sciences), New Zealand (medicine, natural sciences and law) and Pakistan (medicine, natural sciences and technology).

Rhodes Trust, Rhodes House, Oxford. Rhodes scholarships for study at Oxford University are allocated to male nationals of Australia (6), Bermuda (1), the British Caribbean Territories (1), Canada (11), Ceylon (1), Ghana (1), India (2), Jamaica (1), Malaysia (1), Malta (1), New Zealand (2), Nigeria (1), Pakistan (1), Rhodesia (3), South Africa (8 or 9) and the United States of America (32). In most cases, two years' residence at a university is required, and scholars are selected for qualities of intellect and character : age 19 to 25. Tenure is two or three years, renewable, at £900 per annum.

Royal Commission for the Exhibition of 1851, Lowther Gardens, Exhibition Road, London, S.W.7. Senior studentships (4) are available to citizens of the Commonwealth, Ireland and South Africa, for the study of pure and applied science in any country. Candidates must be science graduates showing exceptional promise and nominated by a university in the United Kingdom ; age preferably under 30. Tenure is two years, renewable, at £1,100 per year, plus £100 per annum for fees and books.

Science research scholarships are available to nationals of Australia (2), Canada (3), India (1), New Zealand (1), Pakistan (1) and all other countries of the Commonwealth, as well as Ireland (1) and South Africa (1). Awards are tenable in any country and may be used for research in both pure and applied science. Candidates must be graduates in science ; age normally under 26. Tenure is two years (renewable) at £750 per year, including £100 for fees and books. Applications through university institutions only.

Shell International Petroleum Company Ltd., Shell Centre, London, S.E.1. Scholarships (6) for research in applied science or engineering are available to male nationals of Australia, Canada, New Zealand and South Africa, for study at Oxford, Cambridge or other United Kingdom universities. Tenure is two years at £850 per year.

World University Service Co-operating Committee for Great Britain and Northern Ireland, 59 Gloucester Place, Portland Square, London, W.1. Study loans (30) are available to students of all countries who meet unforeseen difficulties when nearing the end of their studies in the United Kingdom.

Government or official research establishments

Aeroplane and Armament Experimental Establishment, Boscombe Down, Wiltshire, a research establishment of the Ministry of Aviation.

Atlas Computer Laboratory, Chilton, near Didcot, Berkshire. An establishment of the Science Research Council ; provides service for university research and for government and government-supported workers.

Cambridge University Observatories, Madingley Road, Cambridge. Astronomical Observatory and Solar Physics Observatory ; conducts research on solar physics, astrophysics and optics.

Daresbury Nuclear Physics Laboratory, Daresbury, Lancashire : an establishment of the Science Research Council. Engages in electron synchroton research.

Environmental Radiation Research Unit, Department of Medical Physics, General Infirmary, Leeds 1.

Explosives Research and Development Establishment, Waltham Abbey, Essex. A research establishment of the Ministry of Aviation ; conducts research in explosives and propellants.

Institute of Aviation Medicine, Farnborough, Hampshire. Conducts research in aviation and space medicine.

Mullard Radio Astronomy Observatory, Cavendish Laboratory, Cambridge.

Mullard Space Science Laboratory, near Dorking, Surrey (see University of London, University College).

National Engineering Laboratory, East Kilbride, Glasgow, a research establishment of the Ministry of Technology.

National Physical Laboratory, Teddington, Middlesex. A research establishment of the Ministry of Technology with Divisions of Aerodynamics, Control Mechanisms and Electronics, Light, Mathematics, Metallurgy, Applied Physics and Molecular Science.

Nuffield Radio Astronomy Laboratories of the University of Manchester, Jodrell Bank, Lower Withington, Macclesfield, Cheshire. Possesses large steerable radio telescope with reflecting bowl 250 ft wide. Conducts research into galactic and extra-galactic radio emissions, measurement of size of radio sources, radar observation of the artificial satellites of the earth, and of the moon and Venus, control and tracking of space probes.

The Observatory, Armagh, Northern Ireland. Equipment includes an 18/12-inch Schmidt telescope, a 10-inch refractor and two special meteor cameras. A 36/32-inch telescope is operated at the Boyden Obser-

vatory, Bloemfontein, South Africa, in conjunction with the Dunsink Observatory of Ireland.

Observatory of the Department of Astrophysics, Oxford University. Engaged in teaching and research in astronomy and astrophysics, with particular reference to solar physics.

Observatory of the University of London, Mill Hill Park, London, N.W.7. Engaged in teaching and research in astronomy.

Radiobiological Research Unit, Medical Research Council, Harwell, Didcot, Berkshire.

Radio Research Station, Ditton Park, near Slough, Buckinghamshire, an establishment of the Science Research Council. Radio telescope at Chilbolton, Hampshire, used for fundamental research in radio wave propagation and for space research. The station is responsible for the operation at Winkfield, Berkshire, of a minitrack installation for tracking and receiving telemetry from satellites, and also operates small research stations at Lerwick in the Shetland Isles, at Port Stanley in the Falkland Islands, and in Singapore. Adequately qualified foreign students might be able to obtain training in space research by attachment to the research groups at this station, an account of whose activities in geophysics, techniques of measurement and analysis of data is included in the Royal Society's report to COSPAR.

Rocket Propulsion Establishment, Westcott, Aylesbury, Buckinghamshire, a research establishment of the Ministry of Aviation.

Royal Aircraft Establishment, Farnborough, Hampshire. A research establishment of the Ministry of Aviation with Departments of Space, Aerodynamics, Structures, Instrument and Electrical Engineering, Instrumentation and Ranges, Radio, Mathematics, Chemistry, Physics and Metallurgy. Has branch establishments at Bedford, Aberporth, Llanbedr and West Freugh. The Space Department co-ordinates research and development on satellites, ballistic rockets, upper atmosphere research rockets and work by United Kingdom scientists and engineers on the ELDO project.

Royal Armament Research and Development Establishment (RARDE), Fort Halstead, Kent. Conducts research on rockets and guided weapons.

Royal Greenwich Observatory, Herstmonceux Castle, Sussex.

Royal Observatory, Edinburgh 9. This government observatory also houses the Department of Astronomy of the University of Edinburgh. Conducts research and teaching in astrophysics, stellar astronomy, space research and seismology. Adequately qualified foreign students might be able to obtain training in space research by attachment to the research groups at the observatory, an account of whose activities in astronomy and optics is included in the Royal Society's report to COSPAR.

Royal Radar Establishment, St. Andrew's Road, Malvern, Worcestershire. A research establishment of the Ministry of Aviation, dealing with physics, electronics and radar research.

Rutherford High Energy Laboratory, Chilton, near Didcot, Berkshire. An establishment of the Science Research Council; deals with proton accelerators.

Science Museum, South Kensington, London, S.W.7. The national museum of science and industry, with departments of physics, chemistry, electrical engineering and communications, aeronautics, astronomy and geophysics.

Signals Research and Development Establishment, Christchurch, Hampshire. A research establishment of the Ministry of Aviation; conducts research on communications and application of nuclear and electronic techniques.

Spadeadam Rocket Establishment, Spadeadam, Cumberland. Deals with static firing of large rockets. The establishment is managed by Rolls Royce Ltd., for the Ministry of Aviation.

Industrial or commercial research organizations

Aircraft Research Association Ltd., Manton Lane, Bedford (wind tunnel testing and research).

Bristol Aerojet Ltd., Banwell, Somerset (solid and liquid propellant rocket motors, rocket motor cases and pressure vessels, flight research vehicles).

Bristol Siddeley Engines Ltd., Ansty, Coventry (propulsion research rocket motors).

British Aircraft Corporation Ltd., 100 Pall Mall, London, S.W.1.; Guided Weapons Division, Stevenage, Hertfordshire (precision instruments, gyroscopes, inertial systems, electronics, computers, plastics, etc.; satellite construction: Aerospace Office; advanced manned aerospace vehicles).

British Oxygen Company Ltd., Research and Development Centre, Deer Park Road, London, S.W.19. (research in liquid oxygen and other liquefied gases).

British Space Development Company Ltd., A.T.V. House, Great Cumberland Place, London, W.1.; Technical Committee (examination and preparation of plans designed to achieve British participation in space technology).

Elliott Automation Space and Advanced Military Systems Ltd., Chobham Road, Frimley, near Aldershot, Hampshire (aerospace control division, space development laboratory).

Fulmer Research Institute Ltd., Holly Hill, Stoke Poges, Buckinghamshire (research in metallurgy, physical and inorganic chemistry, solid state physics and engineering).

Gravity Rand Ltd., Sussex House, Parkside, Wimbledon, London (research into new forms of force and motion).

Hawker Siddeley Aviation Ltd., Richmond Road, Kingston-upon-Thames, Surrey. Advanced Projects Group (research in supersonic and hypersonic aerodynamics).

Hawker Siddeley Dynamics Ltd., Stevenage, Hertfordshire (launch vehicles and sounding rockets, guidance systems, solar and nuclear powered generators, radio and telemetry equipment, autopilots and control systems for satellites and computer systems for space-craft).

Imperial Metals Industries Ltd., Summerfield Research Station, Kidderminster, Worcestershire (solid propellant rocket motors).

London Planetarium, Baker Street, London, N.W.1.

McMichael Ltd., Wexham Road, Slough, Buckinghamshire ; a subsidiary of General Electric Company Ltd. (electronic and electrical equipment and instruments for research, space research instrumentation and basic components of satellite equipment).

Northern Research and Engineering Corporation International, Mercury House, 195 Knightsbridge, London, S.W.7. (research in thermodynamics, aerodynamics, fluid mechanics, combustion, propulsion and control theory).

Rolls Royce Ltd., Derby (propulsion research ; rocket motors).

Short Brothers and Harland Ltd., Queen's Island, Belfast 3, Northern Ireland (guided weapons and analogue computers).

Universities and colleges

Facilities for training in the various scientific disciplines concerned in the space research programme of the United Kingdom are given in the relevant faculties of practically all the universities. Information on these is available in the *Commonwealth Universities Yearbook* published by the Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

City University, St. John Street, London, E.C.1. Department of Aeronautics. One year full-time or two year part-time course is offered for the M.Sc. degree in aeronautics and space technology. Gresham lectures including series on astronomy are open free of charge to the general public.

College of Aeronautics Cranfield, Bedford. This is a government-sponsored institution for advanced scientific courses and research in aeronautics and certain other fields : includes Departments of Aerodynamics, Design, Electrical and Control Engineering, Flight, Materials, Mathematics and Propulsion. Research and postgraduate courses in aeronautical engineering and science include the general technology of rockets and space flight, and are open to students from any country. A specialized course on space technology is available.

Loughborough University of Technology, Loughborough, Leicestershire. Offers courses in aeronautical, electrical and mechanical engineering, physics and mathematics.

Research fellowships and scholarships are available to graduates or equivalent : three years at £800 to £1,000 per year for fellowships and one year at £400 to £525 for scholarships.

Queen's University of Belfast, University Road, Belfast 1. Faculties of Science and Applied Science and Technology offer mathematics, physics, mechanics, electronics and aeronautics.

Musgrave research studentships in chemistry and physics, for graduates of Commonwealth universities, with capability for original research, are tenable for one year at £325.

Imperial Chemical Industries fellowships for research in chemistry, physics or engineering are available to nationals of all countries. Tenure is three years maximum at £1,000 to £1,300 per year, with allowances.

Visiting studentships of £450 to £650 per year for two years (renewable) are available to graduates of any approved university.

Royal Air Force College, Cranwell, Lincolnshire. Offers courses for general duties and engineer cadets. The one-year courses in aeronautical engineering and armament have been attended by officers of many nationalities ; countries recently represented include Iraq, Israel, Jordan, Ghana, Sudan, Syria, Venezuela and Malaysia.

Royal Military College of Science, Shrivenham, Swindon, Wiltshire. Offers degree courses in engineering and science.

Royal Naval College, Greenwich. Offers courses in engineering, mathematics, physics, nuclear physics and chemistry.

University of Birmingham, Edgbaston, Birmingham 15. Includes Faculty of Science and Engineering, Electron Physics Department ; group engaged in space research in geophysics, included in the Royal Society's report to COSPAR. Adequately qualified foreign students might be able to obtain training in space research by attachment to this group.

Nuffield research fellowships in physics are tenable for two years and may be renewed for one or two further years. Candidates need not be in the United Kingdom to be eligible.

Kansas-Birmingham exchange scholarship is available to a graduate of the University of Kansas, United States of America, for postgraduate work in any faculty. Tenure is one year, at £350 plus tuition fees.

Raymond Priestley fellowship is available every three years to a Canadian graduate of Toronto University for research work in any field. Tenure is two years, at £450, plus travel.

University of Bristol, Senate House, Bristol 2. Includes Faculties of Science and Engineering ; Department of Aeronautical Engineering at Queen's Building, University Walk, Bristol 8.

Michael Hiatt Baker scholarship is open to a graduate from New Zealand to spend two years (renewable) on research for a higher degree. Value is £450 plus fees.

Imperial Chemical Industries research fellowships are available to nationals of all countries, with ability for research in subjects including chemistry, biochemistry, engineering and physics. Tenure is three years maximum, at £900 to £1,200, plus benefits and family allowance.

Wertheimer Trust scholarship in aeronautical, civil, electrical or mechanical engineering is tenable for one year (renewable) at £500, plus fees. Candidates need not be in the United Kingdom to be eligible.

Geoffrey Fertel studentships for experimental research in physics (preferably nuclear) are tenable for two years

(renewable) at not less than £500 per annum. Candidates need not be in the United Kingdom to be eligible.

University of Cambridge, University Observatories, Madingley Road, Cambridge. Conduct research in astronomy, radio astronomy, astrophysics, solar physics and optics. Engineering Department, Trumpington Street, Cambridge, conducts research in aerodynamics. There is a Department of Geophysics.

Fellowships and scholarships in unspecified subjects include Christ's College research studentships (all countries) ; Churchill College Gulbenkian studentships (all countries) ; King's College Ehrman studentships (United States of America) and Commonwealth studentships (Australia, Canada, East Africa and New Zealand) ; Newnham College research fellowships (women) ; St. John's College fellowships (Commonwealth) ; Trinity College bursaries (Europe), research studentships (all countries) and fellowships (West Indies).

Corpus Christi College Plumian research scholarship is open to nationals of all countries for research in natural sciences ; candidates, age under 26, must have a good degree. Tenure is three years at £750 per annum maximum.

Girton College scientific research fellowship is available to female graduate nationals of all countries for independent research in mathematics or natural sciences. Tenure is three years at £400 per year, with free residence.

Shell scholarships in geophysics are available to nationals of all countries. Candidates must have a first class or good second class degree at a British university and will be required to prepare for Ph.D. ; age under 27. Tenure is three years, at £700, plus approved fees.

Isaac Newton studentship is open to candidates with first degree and research experience for research in astronomy (especially gravitational astronomy) and those branches of physical optics which have a direct bearing on astronomy. Candidates need not be in the United Kingdom to be eligible ; age under 25. Tenable for two years at £700 per annum, with up to £150 per annum for fees, books and other expenses.

University of Edinburgh, Edinburgh. Faculty of Science, Department of Astronomy ; the department is established at the Royal Observatory and is especially well equipped for research in astrophysics. The extensive instrumental facilities at the Royal Observatory are available for teaching and research. Courses in astronomy and astrophysics are given for the ordinary and honours (four years) B.Sc. degrees and research students are accepted for further study. Astronomy I is offered as an introductory course ; astronomy II emphasizes astrophysics and stellar astronomy. Specialist courses add the physics of stellar atmospheres and interiors, solar and planetary physics, galactic structure and evolution. Practical courses, colloquia and seminars on various astronomical and geophysical topics are held regularly at the Royal Observatory. A limited number of students can be accepted as vacation students at the Royal Observatory and paid as temporary assistants.

Fellowships are available to nationals of all countries who are graduates of a recognized university and are advanced research workers. Tenure is one year, at £800 for junior fellows and £1,000 for senior fellows.

University of Exeter, Exeter, Devon. Faculty of Science, Department of Physics, offers a postgraduate course for the M.Sc. ; the course is on the earth's environment and is specifically related to space science.

Exchange scholarships (2) are available to graduates from William and Mary College and the University of Kansas in the United States of America. Tenure is one academic year, and awards cover maintenance and tuition.

University of Glasgow, Glasgow, W2. Faculty of Science offers courses in astronomy in the M.A. and B.Sc. courses. Faculty of Engineering, Department of Aeronautics, offers courses in aerospace engineering.

An exchange scholarship is available to a student of Cornell University, United States of America, for one year, covering travel, maintenance and tuition.

Stevenson exchange scholarships are available to graduates and undergraduates of French, German or Spanish universities, for one year at £480.

Exchange fellowships are available to students from Freiburg University, Federal Republic of Germany, for five months at 350 marks per month, plus tuition.

McGill-Glasgow exchange fellowship is available to a graduate of McGill University, Canada, for postgraduate work in subjects including chemistry, physics and geology. Tenure is one year. Award covers maintenance, tuition, $Can 400 for travelling expenses and grant of £120.

University of Leeds, Leeds 2. Faculty of Science offers courses in physics and earth sciences. Adequately qualified foreign students might be able to obtain training in space research by attachment to the group engaged in space research in geophysics and in techniques of measurement in the Physics Department, as listed in the Royal Society's report to COSPAR. Postgraduate research scholarships are available to graduate students from any country for advanced study or research in fields including science and technology. Tenure is three years' maximum, at £475 per annum, plus fees.

University of London, Senate House, London, W.C.1. Administers a very wide variety of courses, including astronomy, aeronautical engineering, aviation, meteorology and telecommunications. Exchange studentships (2) for scientific research (or other purposes) are offered to French nationals of proven research ability. Leon fellowship is open to a student from any country, for research in any field ; tenure is one year at £800. Turner and Newall fellowship and Imperial Chemical Industries fellowship in engineering, chemistry or physics, are available to graduates of all countries who are qualified for post-doctoral research. Tenure is three years at £1,300.

University of London, Imperial College of Science and Technology, Prince Consort Road, London, S.W.7. Department of Meteorology offers a course of research and advanced study leading to the Ph.D. degree in a minimum of two years from the B.Sc. and to the M.Sc. It also offers a formal one-year postgraduate course with

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teaching for third-year undergraduate physics students. Research includes study of the upper atmosphere and mesophere and observational study of winds by Skylark rockets.

Department of Aeronautics: offers one-year postgraduate course for the college diploma, including astronautics.

Department of Geophysics: adequately qualified foreign students might be able to obtain training in space research by attachment to the group engaged in research in geophysics and technique of measurement as listed in the Royal Society's report to COSPAR.

Beit fellowships for scientific and engineering research are open to students of European descent who have taken a degree at a Commonwealth university or hold a diploma of an approved college. Tenure is two years at £650.

Imperial College scholarships and exhibitions are open to nationals of all countries for undergraduate study in science and technology. Candidates take a special examination. Tenure is three years at £75 or £50 per year.

Exchange scholarships are open to graduates or third-year students of any German university, for science or engineering, to postgraduate students of the Rhine Westphalia Institute of Technology, Aachen, for engineering, and to a postgraduate student of the Federal Institute of Technology, Zurich, for science or engineering.

University of London, Queen Mary College, Mile End Road, London, E.1. Includes Faculties of Science and Engineering; offering physics, electrical engineering, nuclear engineering and aeronautical engineering courses. Research studentships are available to nationals of all countries who are graduates. Subjects include physics. Tenure is one year at £400, plus approved fees. Babcock and Wilcox research fellowship in nuclear engineering is available to nationals of all countries, at £700 to £1,000 according to age and experience.

University of London, University College, Gower Street, London, W.C.1. Includes Faculties of Science, Law and Engineering. Physics Department offers a course for the college diploma in space sciences, one year full-time or two years part-time. Space research (some of which is conducted at the Mullard Space Science Laboratory near Dorking, Surrey, operated by the department) includes geophysics, techniques of measurement and analysis of data. There is an extensive programme of upper atmosphere investigation, using instruments carried in artificial satellites and in rockets as well as ground-based observations.

Department of Astronomy, University of London Observatory, Mill Hill Park, London, N.W.7. Offers research and teaching in astronomy. Ten students are admitted annually to specialize in astronomy in the three-year B.Sc. course. Adequately qualified foreign students might be able to obtain training in space research by attachment to one of the groups engaged in space research listed in the Royal Society's report to COSPAR.

Office of International Law and Relations, 4 Endsleigh Gardens, London, W.C.1. Offers courses in international and comparative air law, open to non-degree students.

Corte studentship in mathematics is available to nationals of all countries for study and research for a higher degree. Tenure is one or two years at £55 per year.

Perren studentship in astronomy is available to a national of any country for study and research for a higher degree. Tenure is one to three years at £525 per year.

University of Oxford, Oxford. Includes chairs of astronomy, physics, plasma physics and atmospheric physics. Adequately qualified foreign students might be able to obtain training in space research by attachment to the groups engaged in geophysics and optics research at the Clarendon Laboratory which are listed in the Royal Society's report to COSPAR. Imperial Chemical Industries post-doctoral research fellowships (6) are available to nationals of all countries for research in physics, chemistry or engineering. Tenure is usually three years, at £1,100 to £1,300.

University of Scheffield, Scheffield 10. Includes Faculties of Pure Science, Engineering and Metallurgy, and Departments of Physics and of Electronic and Electrical Engineering. Adequately qualified foreign students might be able to obtain training in space research by attachment to the groups engaged in geophysics research listed in the Royal Society's report to COSPAR.

Imperial Chemical Industries research fellowships (4) are available to nationals of all countries for original research in chemistry, physics or engineering. Candidates must have Ph.D or equivalent. Tenure is three years maximum, at £1,000 to £1,200. Other fellowships are available in metallurgy and mechanical engineering to nationals of all countries.

University of Southampton, Highfield, Southampton. Includes Faculties of Science and Engineering and Institute of Sound and Vibration, offering applied acoustics. Department of Aeronautics and Astronautics offers a three-year B.Sc. course including aerospace design. Department of physics offers electronics. There is a School of Navigation at Warsash, Southampton.

Research scholarships (8) are available to nationals of all countries. Tenure is two years at £400 per year, plus tuition and fees, with payment for some teaching. There is also a postgraduate scholarship for three years at £450 per year.

Postgraduate research studentships in subjects including chemistry, electronics, aeronautical, electrical and mechanical engineering, mathematics and physics are available to graduates with high honours. Candidates need not be in the United Kingdom to be eligible. Tenure is two years, exceptionally three, at £500 per year, plus tuition and fees.

Hawker Siddeley research fellowship and Sir Alan Cobham research fellowship in aeronautics and astronautics are open to honours graduates with two years' practical experience. Tenure is normally three years, at £800 to £1,500 per year. Candidates need not be in the United Kingdom to be eligible.

Spitfire Mitchell memorial studentship in aeronautics and astronautics is open to honours graduates. Candidates need not be in the United Kingdom to be eligible. Tenure is two years, with possible renewal for a third, at £600 per year.

Victoria University of Manchester, Oxford Road, Manchester 13. Includes Faculties of Science and Technology, offering courses in astronomy, radioastronomy, physics, electrical and electronic engineering. (See separate entry for the Nuffield Radio Astronomy Laboratories of the University of Manchester at Jodrell Bank.)

Toronto Fund awards for post-graduate study or research are available to Canadian university graduates, with preference for those of the University of Toronto; amount £100 maximum (renewable).

Turner and Newall research fellowships in engineering, inorganic chemistry and physics are available to nationals of all countries of proven ability in research. Tenure is two years (renewable) at £800 to £1,100.

Imperial Chemical Industries fellowships in physics and chemistry are available to nationals of all countries of proven research ability. Tenure is two years (renewable) at £900 to £1,200.

Research studentships in science, comparable to those of the Science Research Council, are available to university graduates. Tenure is three years.

Working Men's College, Crowndale Road, London, N.W.1. Offers an evening course in astronomy for the General Certificate of Education.

For particulars of fellowships, studentships and bursaries available to nationals of the United Kingdom, and to students at British universities, for study in other countries, see the UNESCO publication, *Study Abroad*.[45]

Hong Kong

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Royal Observatory, Nathan Road, Kowloon, Hong Kong. Possesses a library of 5,000 volumes; retains copies of photographs received directly from meteorological satellites passing over Hong Kong. Publications include meteorological results, seismological bulletins, technical notes, astronomical tables and radioactivity bulletins.

UNIVERSITIES AND COLLEGES

Chinese University of Hong Kong, Hang Seng Bank Building, Nathan Road, Kowloon, Hong Kong. Each of the three constituent colleges, Chung Chi College, New Asia College and United College, offers mathematics and physics in the University Science Faculty.

University of Hong Kong, Pokfulum Road, Hong Kong. Faculty of Science offers physics, electronics and mathematics.

Loke Yew scholarships are offered to needy Chinese students normally resident in Malaysia. Awards are for study in any faculty and cover maintenance and tuition for the duration of the course.

Shell scholarships for study in the Faculties of Science or Engineering are available to nationals of all countries, preferably domiciled in Hong Kong and the Far East. Tenure is four years maximum, at $5,500 per year.

Under the Commonwealth Scholarship and Fellowship Plan, scholarships for post-graduate study in fields including science and engineering are available to Commonwealth graduates from countries other than Hong Kong, age under 35. Tenure is two academic years (renewable) at £51 10s. per month, plus tuition, travel and other allowances.

Seychelles

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Satellite Tracking Station, Mahe, Seychelles.

United States of America

NATIONAL AND STATE ACADEMIES

National Academy of Sciences — National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D.C. 20418. Aim: advancement of science and its use for the general welfare; advises the Government. Sections of the National Academy include mathematics, astronomy, physics, engineering, chemistry and geophysics. Divisions of the National Research Council include physical sciences, mathematics, engineering and industrial research, chemistry and chemical technology, earth sciences and medical sciences. The Space Science Board advises on the programme of research in space, acts as a focus for the interests of scientists in space research, and provides academy representation to and participation in the international scientific activities of the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU).

The academy and council offer 50 to 100 graduate and post-doctoral international university fellowships in space science, sponsored by the National Aeronautics and Space Administration (NASA). These are available to nationals of all countries other than the United States of America whose applications are sponsored by their national or regional space research organizations or, where such organizations are not established, by their national research councils or other appropriate organizations. Awards are for study at selected universities in the United States in the fields of astronomy, biology, chemistry, engineering sciences, geosciences, mathematics, metallurgy, meteorology, optics, physical sciences, space physics, etc. Candidates must be educated to the standard of a Master's degree awarded by a university in the United States, and must meet graduate student entrance requirements at United States universities. A good background in the physical sciences or in engineering should be evidenced, as well as competence in the English language. Fellows will devote full time to

[45] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

theoretical and experimental research and advanced training in any of the space science fields ; they will pursue programmes under the supervision and guidance of prime investigators and will be provided with the necessary experimental and computing facilities. The duration is normally one year. Awards cover the cost of tuition, fees, appropriate research and approved travel within the United States, paid by the National Academy of Sciences. Maintenance and travel to the United States of America and return for the fellow and accompanying dependants are provided by the sponsoring organization.

These fellowships are tenable at the Universities of Alabama, Arizona, California, (Berkeley and Los Angeles), Chicago, Cincinnati, Colorado, Iowa, Maryland, Michigan, Minnesota, Rochester and Wisconsin, at the California and Massachusetts Institutes of Technology, and at Columbia, Cornell, Harvard, New Mexico State, Ohio State, Princeton, Rice, Stanford and Yale Universities, California Institute of Technology, Graduate Research Centre of the South-west, Southern Methodist University, Texas Christian University.

Applications should be made to the Office of Scientific Personnel at the foregoing address, or to the candidate's national or regional space research organization.

Post-doctoral and senior post-doctoral resident research associateships are offered in aerospace sciences and technologies to nationals of all countries. The purpose of these grants is to provide, to investigators of unusual ability and promise, an opportunity to further their theoretical or experimental research interests at NASA centres, while bringing to NASA the benefit of their knowledge and skills in scientific projects of value to the United States space programme. Interests are in the various areas of science and technology related to space exploration, including the physics of planetary and lunar atmospheres, particle physics of the space environment, space biosciences and engineering.

Applicants must have qualifications equivalent to the Ph.D. or Sc.D. degrees, superior ability for creative research, and full command of the English language. Associateships are tenable at Ames Research Centre, Moffett Field, California (physical sciences and space biosciences) ; Goddard Space Flight Centre, Greenbelt, Maryland, and Institute for Space Studies, New York City (physics, astronomy, earth sciences and certain biosciences) ; Langley Research Centre, Hampton, Virginia (various areas of science related to space exploration, including physics of planetary and lunar atmospheres, particle physics of the space environment, and engineering) ; Manned Spacecraft Centre, Houston, Texas (space medicine and environmental physiology, spacecraft structures, aerodynamic guidance and propulsion, space and planetary environments and manned space flight experiments) ; George C. Marshall Space Flight Centre, Huntsville, Alabama (physics of planetary and lunar atmospheres, particle physics of the space environment, and engineering), Electronics Research Centre, Cambridge, Mass. and the Jet Propulsion Laboratory, Pasadena, California.

Tenure is normally one year (renewable). The stipend for the regular resident research associate is normally $11,500 per year, adjusted for the senior associate according to his salary, with a dislocation allowance. An appropriate travel grant is determined for each associate. Applications should be made to the Office of Scientific Personnel at the foregoing address.

New York Academy of Sciences, 2 East 62nd Street, New York 21, N.Y. 10021. Includes Sections of Instrumentation, physical sciences, biophysics, engineering, mathematics, planetary sciences and environmental sciences.

Government departments and official agencies

Environmental Science Services Administration, including the Directorate of Meteorological Research, Washington, D.C.

Central Radio Propagation Laboratory, Boulder, Colorado. Technical divisions include ionospheric telecommunications, tropospheric telecommunications, space environmental forecasting and aeronomy.

Weather Bureau, Twenty-Fourth and M Streets, N. W., Washington 25, D.C. Concerned with meteorological research, climatology, data acquisition and communications ; serves as national weather satellite centre.

National Aeronautics and Space Administration (NASA), 400 Maryland Avenue, S.W., Washington, D.C. 20546. Concerned with tracking and data acquisition, manned space flight, space sciences and applications, advanced research and technology. Includes the following establishments :

George C. Marshall Space Flight Centre, Huntsville, Alabama (manufacturing engineering, aeroballistics, aerodynamics, astrodynamics, astrionics, propulsion, vehicle engineering, thermophysics, molecular spectroscopy, radiation effects, space shielding, meteoroid physics, hypervelocity impact, reaction kinetics of the upper atmosphere, surface physics, rigid body motion, topology, lunar geology, geophysics, plasma physics, solid state physics, application of high speed computers and data processing equipment to problems in research and development of large launch vehicles) ;

Manned Spacecraft Centre, Houston, Texas (spacecraft propulsion and energy conversion, space medicine and environmental physiology, aerodynamics, structures and materials, guidance and control, space and planetary environments (lunar and martian), manned space flight experiments, instrumentation and communications, computer science and applications) ;

John F. Kennedy Space Centre ;

Goddard Space Flight Centre, Greenbelt, Maryland (theoretical research into celestial mechanics, origin, structure and stability of radiation belts and magnetopause, structure and time variations of upper atmosphere of earth and planets, quantum theory of atomic, ionic, electronic and molecular scattering processes, theory of waves and wave-particle interactions, lunar structure, geology and origin of tektites ; experimental research into ionospheres of earth and planets, airglow, planetary and interplanetary magnetic fields, auroral and radiation belt particles, cosmic rays, interplanetary plasma, solar and stellar structure,

radio sources, interstellar and intergalactic media, pressure, temperature, density, composition and circulation of atmospheres of earth and other planets, atmospheric biology and sterilization, lasers for optical communications and tracking, communication theory, digital data handling and similar subjects related to both optical and radio systems for transmission of telemetry and tracking data, radio frequency systems and antennae) ;

Jet Propulsion Laboratory of the California Institute of Technology, Pasadena, California (a contractor-operated establishment for project engineering, including systems engineering and operations research and spacecraft environmental requirements, basic and space sciences, aerothermodynamics, engineering mechanics, guidance and control, mathematical and computer sciences, propulsion and telecommunications) ;

Pacific Launch Operations Office. Lompoc, California ;

Wallops Station, Wallops Island, Virginia ;

Ames Research Centre, Moffet Field, California (physical sciences ; advanced guidance studies, modern control theory, interference flow fields, high temperature gas physics, low-speed aerodynamics, magneto-hydrodynamics, solid state chemistry and physics of materials, planetary and interplanetary magnetic fields and plasmas, planetary atmospheres, solar magnetic fields and plasma, astrophysical magneto-hydrodynamics ; biosciences ; exobiology, environmental biology and biotechnology) ;

Flight Research Centre, Edwards, California ;

Langley Research Centre, Hampton, Virginia (physics of high temperature gases, magnetoplasmadynamics, dynamics and acoustics, aerospace guidance and control, structures and materials, space radiation effects);

Lewis Research Centre, Cleveland, Ohio ;

Electronics Research Centre : research in all aspects of aerospace electronics materials and associated component technology, guidance, navigation, control and stabilization of aerospace vehicles, aerospace electronic systems analysis, integration and simulation of guidance, control tracking, communication and instrumentation functions characteristic of spacecraft, solid state physics, microwave propagation, microwave and optical communications, and airborne and ground supporting aerospace computations and instrumentation technology ;

Institute for Space Studies, New York, N.Y. (theoretical research ; stellar structure and evolution, nucleosynthesis, origin and development of the solar system, physics of planetary bodies and their atmospheres ; basic studies in meteorology and theories of turbulence, convection and radiative transfer).

Education and training in the space sciences and space-related engineering and technical skills are an important and major part of the programme of international co-operation of NASA. The opportunities for education and training open to nationals of other countries fall into three categories : NASA international university fellowships in space science (graduate and post-doctoral), NASA resident research associateships (post-doctoral and senior post-doctoral), and training in connexion with NASA co-operative projects with other countries.

NASA international university fellowships were established to assist other nations and groups of nations in their efforts to develop scientific space programmes. To this end, the university fellowships provide opportunities for up to 100 promising young scientists from abroad to study and participate in research in the space sciences at leading universities in the United States (for details, see entry for the National Academy of Sciences — National Research Council).

The purpose of the NASA resident research associateships is to provide investigators of unusual ability and promise with an opportunity for theoretical or experimental research at NASA centres in the various areas of science and technology related to space exploration. These include the physics of planetary and lunar atmospheres, particle physics of the space environment, space biosciences and engineering (for details, see entry for the National Academy of Sciences — National Research Council).

Training is an integral part of virtually every NASA co-operative project. The extent of training in any given programme depends on the needs of the co-operating nation, its responsibilities in the joint project, and the scientific and technical character of the project itself. Thus, in one of its co-operative satellite projects, NASA provides training in satellite engineering, techniques for launching the satellite into orbit, procedures for tracking and acquisition of data from the satellite, and reduction and analysis of the data. In co-operative sounding rocket projects, training may be provided in the fabrication of scientific payloads, procedures for launching rockets, tracking and data acquisition, and data reduction. This training is carried out at NASA centres such as the sounding rocket range at Wallops Island, Virginia, or the Goddard Space Flight Centre, near Washington, where foreign scientists and engineers work side by side with their NASA counterparts in actual operations connected with the joint projects. NASA assumes the cost of the training while the co-operating national space organizations provide for the costs of travel to and from the United States and for the salaries and subsistence of their personnel during the training period.

During the academic year 1966-67, 40 NASA International University Fellows from 13 countries studied at 18 universities in the United States of America. During 1966, 115 scientists from 28 countries held NASA Resident Research Associateships, and 62 scientists, engineers and technicians from six countries and ESRO received NASA training in connexion with agreed co-operative programmes.

Smithsonian Institution, The Mall, Washington 20560, D.C. Aim : the increase and diffusion of knowledge among men. Government bureaux under the administration of the Smithsonian Institution include the National Air and Space Museum, the Astrophysical Observatory, the Radiation Biology Laboratory and the Science Information Exchange. Overseas interests include satellite tracking stations in Ethiopia and Iran.

Space Nuclear Propulsion Office; extensions at Jackassflats, Nevada, at Albuquerque, New Mexico and at Cleveland, Ohio.

Learned societies, professional institutions and other associations

Aerospace Corporation, 2350 East El Segundo Boulevard, El Segundo, California. This non-profit organization for the advancement of space science and technology, serves the Government in the scientific and engineering planning and direction of rocket and space programmes.

Aerospace Electrical Society, 3540 Wilshire Boulevard, Los Angeles 5, California. Devoted to advancement of electrics and electronics for aircraft and spacecraft.

Aerospace Industries Association of America, Inc., 1725 DeSales Street, N.W., Washington D.C. 20036. This is the national trade association of designers and manufacturers of aircraft, spacecraft, propulsion, navigation and guidance systems and components.

Aerospace Medical Association, c/o Dr. William J. Kennard, Washington National Airport, Washington 1, D.C.

American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington 5, D.C.

American Astronautical Society, Inc., 1629 K Street, N.W., Washington, D.C. 20006.

American Institute of Aeronautics and Astronautics, 1290 Sixth Avenue, New York, N.Y. 10019. Includes technical committees for space and atmospheric physics, fluid dynamics, astrodynamics, propellants and combustion, liquid rockets, solid rockets, electric power systems, electric propulsion, nuclear propulsion, communications, instrumentation, guidance and control, structures, spacecraft, entry vehicles, launch vehicles, aerodynamic deceleration systems, atmospheric environment, ground testing and simulation, ground systems and equipment, law and sociology, life sciences and systems, plasmadynamics, reliability and maintainability, structural dynamics, thermophysics, etc. The institute is a professional society of engineers and scientists devoted to the advancement of aeronautics and astronautics through the interchange of technological information in its publications and at its meetings. The institute's student programme involves over 5,000 members in 100 student branches.

American Interplanetary Society, 20th and Northampton Streets, Easton, Pennsylvania.

American Meteorological Society, 45 Beacon Street, Boston, Massachusetts 02108. Aim: development and dissemination of knowledge of meteorology.

Franklin Institute Fels Planetarium, 20th Street and Benjamin Franklin Parkway, Philadelphia, Pa. 19103. Includes astronomy, meteorology and aerospace sections.

Institute of Environmental Sciences, P.O. Box 191, 34 S. Main Street, Mount Prospect, Illinois. Conducts educational activities for rocket engineers involved in environment simulation.

Institute of Navigation, Suite 912, 711 14th Street, N.W., Washington, D.C. 20005: a scientific and engineering society for the advancement of navigation and related sciences.

Los Angeles International Air and Space Exposition, First Federal Building, Hollywood Boulevard at Highland Avenue, Hollywood 28, California.

Michigan Aeronautics and Space Association, 901-06 Book Building, Detroit 26, Michigan.

National Aerospace Education Council (NAEC), 616 Shoreham Building, Washington, D.C. 20005.

National Aviation Club, Hotel Washington, 15th Street at Pennsylvania Avenue, N.W., Washington D.C. Concerned with promotion of aviation and space education teaching aids and of aviation and space education in schools throughout the nation.

National Space Club, 1629 K Street N.W., Suite 500, Washington, D.C. 20006.

Retirement International Inc., 73-863 Highway 111, P.O. Box 129, Palm Desert, California: an educational non-profit association for exchanging tape recordings on magneto-hydrodynamics, cryogenics and electronics in the aerospace industries.

United States Rocket Society Inc., Box 271, Pittman, Nevada: a non-profit corporation for dissemination of rocket information in the cause of interplanetary flight and exploration.

Foundations and trusts

African-American Institute, 345 East 46th Street, New York, N.Y. 10017. Administers the African scholarship programme of American universities (ASPAU), and the African graduate fellowship programme (AFGRAD). The ASPAU scholarships (200) for study in the United States are for candidates age 17 to 27 with university entrance qualifications; tenure is up to four years or until completion of bachelor's degree. AFGRAD fellowships (75) are for candidates age 23 to 40 with a good first degree or equivalent, nominated by their Governments for the proposed course of study. Tenure is one year (renewable). The institute also administers other programmes to enable African students to acquire training abroad, either in another African country or in the United States of America.

African-American Universities Programme, Rosenwald Hall, University of Chicago, 1101-11 East 58th Street, Chicago, Illinois 60637. Exchanges are arranged between staff members or prospective members of African universities and faculty members or advanced graduate students in the United States of America. The programme is financed by a grant from the Ford Foundation.

Alliance française of New York Inc., 11 East 84th Street, New York, N.Y. 10028. Scholarships (27) are available to nationals of France for study in the United States of America and *vice versa*. Tenure is one year at $1,100 per annum. Additional scholarships are available for candidates specializing in engineering, physics and chemistry.

American Association of University Women Educational Foundation, 2401 Virginia Avenue N.W., Wash-

ington, D.C. 20037. Offers fellowships of $5,000 in the natural sciences to candidates possessing a doctorate in the field of research concerned: (*a*) the Marie Curie fellowship in radiology, physics or chemistry, open to women from France or the United States of America; (*b*) the Sarah Berliner fellowship in physics, chemistry or biology, open to women of any country.

American-Scandinavian Foundation, 127 East 73rd Street, New York, N.Y. 10021. Administers fellowships and travel grants available to nationals of Sweden for study in the United States of America and *vice versa,* including graduate study, special research, summer projects and teachers' seminars. Graduate fellowships are available to well-qualified students from Denmark, Finland, Iceland, Norway and Sweden.

American-Swiss Foundation for Scientific Exchange Inc., Hoffman-La Roche Inc., Nutley, New Jersey 07110. Offers fellowships in natural sciences to Swiss nationals for advanced research in the United States of America and reciprocally. Awards are open to post-graduate students, teachers and others in scientific fields with Ph.D. or equivalent experience. Tenure is one year (renewable) at $2,500 per year.

Anaconda Copper Mining Co., Anaconda. Offers fellowships (4) to nationals of Chile for study in the United States of America, preferably in engineering subjects. Tenure is one year, renewable, at $2,750.

Belgian-American Educational Foundation, Inc., 420 Lexington Avenue, New York, N.Y. Fellowships (25) of the Commission for Relief in Belgium, 1914-1918, are available to nationals of Belgium for study in the United States of America and reciprocally; candidates must have a university degree.

Braniff International Airways, Love Field, Dallas, Texas 75235. Offers travel grants (30) to nationals of Latin American countries for graduate studies in the United States of America.

China Institute in America, 125 East 65th Street, New York, N.Y. 10021. Fellowships (5) are available to Chinese students who have already completed at least one year of study at a recognized graduate school in the United States of America and are candidates for an advanced degree.

Commonwealth Fund, 1 East 75th Street, New York, N.Y. 10021. Offers fellowships to citizens of Australia, New Zealand, the United Kingdom and western European countries, with a university degree or equivalent, age 21 to 32, for study in the United States of America. Tenure is twelve to twenty-one months.

Cordell Hull Foundation, 536 International Trade Mart, New Orleans, Louisiana. Offers awards for study in the United States of America to nationals of Latin American countries who have a working knowledge of English and are in actual need of financial assistance.

English-Speaking Union of the Commonwealth, 16 East 69th Street, New York, N.Y. 10021. Offers awards to nationals of the United Kingdom for study in the United States of America and *vice versa.* Graduate assistantships are offered to students of honours degree standard, age under 36, for one year of part-time post-graduate study and part-time teaching and/or research in an American university. Fellowships are offered to honours graduates under 30, for postgraduate study; tenure is one year at $2,000 minimum.

John Simon Guggenheim Memorial Foundation, 90 Park Avenue, New York, N.Y. 10016. Fellowships are available to students from Canada, the Philippines, the United States of America, the British Caribbean territories and the Latin American Republics for research in any field of knowledge in the United States of America, or for nationals of the United States of America in any other country. Candidates should have a Ph.D. degree or equivalent, age normally 30 to 45; tenure normally one year.

Institute of International Education, 809 United Nations Plaza, New York, N.Y. 10017. Administers scholarships offered by foreign Governments, educational institutions, foundations, corporations, private donors, student and professional associations in the United States of America and abroad. Assists the United States Government in the administration of grants under the Fulbright-Hays Act and administers the Ryukyuan scholarship programme. Scholarships (approximately 1,500) are available to nationals of most countries, age preferably under 35, for study in the United States of America, generally at the university or post-graduate level; tenure is usually one academic year and the value varies from tuition only to full support.

Exchange scholarships are available to United States graduate students. The exchange programmes benefit about 1,500 United States students and 5,000 foreign students each year.

The institute also administers a number of individual and group projects in various fields involving leaders, specialists and trainees, usually selected by the sponsoring organization. It arranges special summer programmes, English-language training and orientation for newly arrived students, supervising students through its regional offices, advising on special problems and acting as liaison between the student and his sponsor. In the international exchange of leaders and specialists, it arranges for men and women from abroad in the professions, business and government to work in or visit United States laboratories, factories and research centres. The institute publishes handbooks, guides and informational brochures, encourages and conducts research, conducts seminars and conferences on international education, and maintains a reference library.

International Science Foundation, Sunnyvale, California.

Japan Society, Inc., 112 East 64th Street, New York, N.Y. 10021. Offers grants-in-aid, from $200 to a maximum of $500, to nationals of Japan, for special purposes such as purchase of books or research materials. Candidates should be visiting professors, lecturers or research scholars in the United States of America whose income does not exceed $4,000 per year.

Josephine de Karman Trust, First Western Bank and Trust Co., Colorado at Madison, Pasadena, California. Offers three scholarships established by the late Dr. Theodore von Karman for study in the United States of America in approved fields of advanced learning, avail-

able to candidates of all countries. Candidates must be of university level or equivalent ; tenure one year (renewable) at $2,500.

National Science Foundation, Washington, D.C. 20550. Offers senior foreign scientists fellowships (60) to nationals of all countries who have already demonstrated outstanding ability in fields including mathematical, physical, medical, biological and engineering sciences. Tenure is five months to one year, at United States participating institutions.

Netherlands-America Foundation, 10 Rockefeller Plaza, New York, N.Y. 10020. Offers fellowships to graduate students from the Netherlands for study in the United States of America, and *vice versa* ; tenure one year at up to $1,000.

Pan American-Grace Airways (Panagra), Chrysler Building, New York, N.Y. 10017. Offers travel grants (30) to nationals of Latin American countries.

Pan American World Airway System, Pan-Am Building, New York, N.Y. 10017. Offers travel grants (30) to nationals of Latin American countries for graduate studies.

Phelps-Stokes Fund, 297 Park Avenue South, New York, N.Y. 10010. Offers fellowships open to nationals of African countries for study in the United States of America ; candidates must possess B.A. degree, age 21 to 35.

Quota International Inc., 1145 Nineteenth Street, N.W., Washington, D.C. 20036. Offers international fellowships (3) to female nationals of most countries for graduate study in the United States of America ; tenure one year (renewable) at $1,400 per year.

Russian Student Fund Inc., 215 West 23rd Street, New York, N.Y. Offers study loans to refugee students who are Russians by birth or descent, permanently resident in the United States of America. Candidates must have completed one semester in an American university with satisfactory results.

Sheldon Fund, 906 Holyoke Centre, Cambridge, Massachusetts. Offers fellowships to men students from Commonwealth countries and to a French student at the Ecole normale supérieure in Paris, for graduate study at Harvard University ; tenure in each case is one year.

Telluride Association, 217 West Avenue, Ithaca, N.Y. 14850. Offers graduate fellowship to a student from any country for study at Cornell University. Tenure is one year, the award covering maintenance, tuition and fees.

United States-United Kingdom Educational Commission, 71 South Audley Street, London, W.1. Under the provisions of the Fulbright programme, offers travel grants for academic study, research or lecturing in the United States of America to suitably qualified citizens of the United Kingdom and dependent territories. Awards cover the cost of the return journey between a candidate's home and his place of study in the United States of America.

World University Service, Refugee Student Loan Fund, 20 West 40th Street, New York, N.Y. 10018. Offers awards to Hungarian refugee students already in the United States of America on a refugee visa. Candidates must have satisfactory academic background and admission to an accredited college or university in the United States of America. Fellowship training grants for study in the United States of America are available to Chinese-speaking school teachers on leave from post-secondary school institutions in Hong Kong.

Government or official research establishments

Applied Physics Laboratory, Johns Hopkins University, 8621 Georgia Avenue, Silver Spring, Maryland. Conducts research and development of rockets and satellites.

Cornell University, Cornell Aeronautical Laboratory Inc., P.O. Box 235, 4455 Genesee Street, Buffalo, N.Y. 14221. Technical departments include flight research, aerodynamics, computer research, systems research, hypersonics, electronics, avionics and aerospace vehicles ; research and development include physics, human factors, operations research, rocket dynamics, manned space flight and space reconnaissance systems.

Denver Research Institute, University of Denver, Boettcher Ctr., Denver 10, Colorado. Research interests include electronics, metallurgy and physics.

Franklin Institute, Suite 507-1101 17th Street, N.W., Washington, D.C. Research and development laboratories include those for electronics, control systems, solid state physics, metallurgy, aerospace sciences and applied physics.

Gravity Research Foundation, Gravity Village, New Boston, New Hampshire.

Illinois Institute of Technology, 35 West 33rd Street, Chicago, Illinois 60616. Research Institute, 10 West 35th Street, Chicago, Illinois 60616. Conducts research in astronautical sciences, chemistry, computer sciences, electromagnetics, electronics, fluid dynamics, geophysics and life sciences.

Stanford Research Institute, Menlo Park, California. A non-profit organization for research in engineering, physical, radio, chemical, electronic and systems sciences.

Wenner Gren Aeronautical Research Laboratory, Lexington, Kentucky. Conducts research in bio-engineering and bio-astronautics. The parent organization is the Kentucky Research Foundation of the University of Kentucky.

Industrial or commercial research organizations

Aerochem Research Laboratories Inc., P.O. Box 12, Princeton, New Jersey (parent company, Pfaudler Permutit Inc.). Conducts basic research in aerothermodynamics, energy transport, physical chemistry of combustion, magnetohydrodynamics, plasma physics, solid propellants, radar attenuation and advanced propulsion systems.

Aerometric Research Inc., Santa Barbara Airport, Goleta, California. Engaged in applied meteorological research.

Aeronautical Research Associates of Princeton, Inc., 50 Washington Road, P.O. Box 229, Princeton, New Jersey. Engaged in advanced research and consulting

services in areas of hypersonic gas dynamics, magneto-hydrodynamic power generation, heat transfer, aero-dynamic noise, guidance and control, celestial mechanics, aeroelasticity, dynamic response and systems analysis.

Alderson Research Laboratories, Inc., 48-14 33rd Street, Long Island City 1, New York. Concerned with anthropomorphic test dummies, radiation monitoring systems, simulators and mechanical instrumentation.

Arinc Research Corporation, Annapolis Science Centre, Maryland. Conducts research in reliability, maintainability and system effectiveness of ground, air and space equipment and systems.

Arma Division, American Bosch Arma Corporation, Roosevelt Field, Garden City, New York. Concerned with systems evaluation, inertial navigation systems and research in guidance for rockets.

Associates for Astronomical Research. A joint undertaking by General Electric Space Sciences Laboratory and the University of Pennsylvania.

Astronautics Corporation of America, 907 S. First Street, Milwaukee, Wisconsin 53204. Concerned with instrumentation, computers, attitude control, navigation, satellite telemetry and tracking.

Astro-Space Laboratories Inc., Huntsville, Alabama. Handles space vehicle systems.

Atlantic Research Corporation, Shirley Highway and Edsall Road, Alexandria, Virginia ; Electronics and Communications Division, Missile Systems Division, Propulsion and Chemical Systems Division. Engaged in research and development in combustion, thermodynamics, high-temperature materials, nuclear technology, solid-liquid propellants, electronics, communications, space technology, sounding and control rockets and rocket components.

Atmospheric Research Group, 2420 North Lake Avenue, Altadena, California.

Avco, Everett Research Laboratory, 2385 Revere Beach Parkway, Everett 49, Massachusetts. Concerned with advanced engineering in satellite design and ion propulsion systems for space vehicles.

Avco Research and Advanced Development Division, 201 Lowell Street, Wilmington, Massachusetts. Concerned with re-entry vehicle systems, space vehicle systems, re-entry communications and propulsion sub-systems.

Ball Brothers Research Corporation, Industrial Park, Boulder, Colorado. Concerned with stabilized space platforms, satellite systems, telemetry and tracking, electronic and optical components ; prime contractors for NASA orbiting solar observatories.

Beechcraft Research and Development Inc., Wichita, Kansas. Conducts research and development on orbital and space vehicle systems.

Bellcomm Inc., 1100 Seventeenth Street, N.W., Washington, D.C. 20036. Engaged in technical studies, systems planning, analysis and engineering for the NASA manned space flight programme. The parent organization is the Bell Telephone System.

Bendix Corporation Research Laboratories, 20800 10 1/2-mile Road, Southfield, Michigan 48076. Conducts research and development in solid state physics, thin film techniques, microcircuits, space environment effects, radiation-hardened electronics, microwave devices, physical measurements, electron multipliers, aerospace guidance and control systems analysis and simulation, rocket guidance and control systems, ultra-wideband communication data link techniques, energy conversion systems for space power, dynamic control systems and components.

Bendix Systems Division, 3300 Plymouth Road, Ann Arbor, Michigan 48107. Concerned with major systems for rockets, satellites, space probes, extraterrestrial surface exploration, space communications and space environmental laboratories testing.

Bjorksten Research Laboratories, P.O. Box 265, Madison, Wisconsin 53701. Conducts research in high temperature materials, physics, adhesives and plastics.

Boeing Company, Aerospace Division, Box 3707, Seattle, Washington 98124. Concerned with Saturn booster, Voyager systems and lunar orbiter programme.

Cook Electric Company, Tech-Centre Division, 6401 Oakton Street, Morton Grove, Illinois. Conducts research in aerospace vehicle landing systems, simulators and instrumentation, environmental testing.

Communications Satellite Corporation, 1900 L Street, N.W., Washington, D.C. 20006.

Component Evaluation Laboratories, 1432 Potrero Avenue, South El Monte, California. Possesses specialized facilities for conducting all phases of natural, induced and combined environmental testing in the areas of propellants, electronic components, etc.

Cosmic Inc., 3206 Grace Street, N.W., Washington, D.C. Conducts research in high voltage D.C. generators and electrostatic propulsion.

Creare Inc., P.O. Box 226, Hanover, New Hampshire. Conducts research in heat and mass transfer, plasma generators.

Electro-Optical Systems Inc., 300 N. Halstead Street, Pasadena, California. Conducts research on space propulsion systems and ion engines.

Fairchild Hiller Corporation, Space Systems Division, 1455 Research Boulevard, Rockville, Maryland. Concerned with meteoroid detection satellites, expandable space structures, data interpretation systems.

FMC Central Chemical Research Laboratory, San José, California. Conducts research and development work on rocket fuels.

General Applied Science Laboratories Inc., Merrick and Stewart Avenues, Westbury, Long Island, New York. Conducts research in aerodynamics, propulsion, electronics and space sciences.

General Astronautics Research Corporation, P.O. Box 6285, Washington, D.C. 20015, Astronautics Education Division. Conducts space science and technology research and studies of satellites and space vehicles, and provides astronautical education advisory services.

General Atomic Division, General Dynamics Corporation, San Diego, California. Provides auxiliary power systems for space vehicles.

Giannini Research Laboratory, 3839 South Main

Street, Santa Ana, California. Conducts research in electrothermal propulsion, plasma generators.

Honeywell Inc., 2747 Fourth Avenue, South Minneapolis, Minnesota 55408. Concerned with space vehicle control systems.

Hughes Research Laboratories, 3011 Malibu Canyon Road, Malibu, California. Conducts electronics research.

International Telephone and Telegraph Corporation, Astrionics Laboratory, Fort Wayne, Indiana.

Ion Physics Corporation, Burlington, Massachusetts.

Isomet Corporation, 433 Commercial Avenue, Palisades Park, New Jersey. Conducts research on solid state devices, fuel cells, life support systems, lasers.

Marquardt Corporation, 16555 Saticoy Street, Van Nuys, California. Conducts aerospace technology research covering, propulsion equipment, control and stabilization thrusters, rocket components.

McDonnell Aircraft Corporation, P.O. Box 516, Lambert St. Louis Municipal Airport, St. Louis 63166, Missouri. Prime contractor for the Gemini spacecraft for orbital flight of manned vehicles.

National Research and Development Corporation (NRDC), 15 Sixteenth Street at Peachtree, Atlanta, Georgia. Includes bioastronautics, astronautics and geoscientific divisions. General Astronautics Corporation has merged with NRDC and provides the educational programme.

North American Aviation Inc., 1700 E. Imperial Highway, El Segundo, California. Includes Space and Information Systems Division (rockets and space vehicles, research on earth-space communications), Autonetics Division (inertial guidance systems, computers, radar, microelectronic circuitry), Rocketdyne Division (rocket propulsion systems), Los Angeles Division (X-15 space research vehicle) and Science Centre (fundamental research in physics, chemistry, metallurgy and mathematics).

Northern Research and Engineering Corporation, 219 Vassar Street, Cambridge 39, Massachusetts. Conducts research in thermodynamics, aerodynamics, fluid mechanics, combustion and propulsion.

Northrop Institute of Technology, 1111 W. Arbor Vitae Street, Inglewood, California.

Northrop Space Laboratories, Northrop Norair Division, 3401 W. Broadway, Hawthorne, California. Concerned with space vehicles and space systems for manned and unmanned earth-orbital, lunar and interplanetary missions. Research activities include plasma physics, nuclear physics, structures and materials, magnetics, gravity, planetary physics and chemistry, and bioastronautics.

Phoenix Chemical Laboratory, Inc., 3953 Shakespeare Avenue, Chicago, Illinois 60647. Conducts research in fuels and lubricants for space vehicles.

Radiation Inc., P.O. Box 37, Melbourne, Florida 32902; Astrionics Division. Conducts research in electronics, instrumentation, space and global communications, automatic check-out, data acquisition and processing, telemetry and tracking.

Radio Corporation of America (RCA), 30 Rockefeller Plaza, New York, N.Y. Includes Missile Electronics and Controls Department (electronic devices for space vehicles), Aerospace Systems Division, P.O. Box 588, Burlington, Massachusetts 01801, and Astro-Electronics Division, P.O. Box 800, Princeton, New Jersey 08540 (meteorological satellites and ground equipment).

Republic Aviation Corporation, Division of Fairchild Hiller Corporation, Farmingdale, Long Island, New York. Includes laboratories for space environment and life sciences, re-entry simulation, nuclear radiation, electronics, guidance and control systems; manned spacecraft systems; plasma engines for space propulsion.

Rocket Research Corporation, 520 South Portland Street, Seattle, Washington 98108. Deals with attitude control rockets (monopropellant hydrazine and subliming solid), gaseous bipropellant rockets, high energy monopropellant propulsion systems, high density solid propellants and explosives.

Southwest Research Institute, 8500 Culebra Road, San Antonio 6, Texas.

Space Sciences Laboratories, Litton Industries, 333 North Foothill Road, Beverley Hills, California. Deals with space environment simulation, space suits, re-entry simulation, plasma physics and laser physics.

Systems Corporation of America, 1007 Broxton Avenue, West Los Angeles, California 90024. Conducts research in space system.

Thompson Ramo Wooldridge Inc., 23555 Euclid Avenue, Cleveland, Ohio 44117. Conducts research in electronics. Systems Group, 1 Space Park, Redondo Beach, California, manages Atlas and Titan projects for the United States Air Force and is prime contractor for the NASA orbiting geophysical observatory. Conducts research in controlled fusion, magnetohydrodynamics, cryogenics, magnetics, superconductivity, hypersonics, space physics and ionosphere physics. Conducts applied research in space vehicles, satellites, propulsion, guidance, control, tracking and data acquisition.

United Aircraft Corporate Systems Centre, Farmington, Connecticut. Concerned with inertial guidance for missiles and rockets, data handling, structural systems and space mechanics.

United Technology Centre, United Aircraft, P.O. Box 358, Sunnyvale, California. Conducts research in solid and liquid propellants, rockets and advanced propulsion systems.

Westinghouse Astroelectronic Department, P.O. Box 245, Newbury Park, California. Conducts research in space applications.

Westinghouse Electric Corporation, 3 Gateway Centre, P.O. Box 2278, Pittsburgh, Pennsylvania. Includes aerospace and aerospace electrical divisions, astroelectronics and astronuclear laboratories. Concerned with nuclear energy, space systems, electric propulsion, fuel cells, magnetohydrodynamics, scientific and navigation satellites, instrumentation.

Whirlpool Corporation, Room 300, 221 N. Lasalle Street, Chicago 1, Illinois. Conducts research in life support systems for outer space and nutrition in space.

Winzen Research Inc., 401 W. 84th Street, Minnea-

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polis, Minnesota. Conducts research in plastic stratosphere balloons and instruments, manned and instrumented space capsules.

Wyle Laboratories, 128 Maryland Street, El Segundo, California. Conducts aerospace research in cryogenics, fuels, electronics.

Yellott Solar Energy Laboratory, 9051 North Seventh Avenue, Phoenix, Arizona. Concerned with solar energy control and utilization and radiometers.

Universities and colleges

Most major colleges and universities in the United States have programmes or courses in space sciences and related disciplines. Such programmes and courses are listed in the catalogues of these institutions, together with the terms of admission, tuition, scholarships, fellowships and other necessary information.

Boston University, Bostson, Massachusetts 02215. Includes College of Engineering, with department of aeronautical engineering. Scholarships (2) covering full tuition and fees are open to African students.

Brevard Engineering College, Melbourne, Florida. Offers undergraduate and graduate courses in space technology.

Brown University, Providence, Rhode Island 02912. Offers astronomy and aerospace studies. Exchange scholarships of $2,300 covering tuition and fees are open to students from Kiel University, Federal Republic of Germany.

California Institute of Technology, Pasadena, California. Includes Divisions of Physics, Mathematics and Astronomy and of Engineering and Applied Science. Offers space science courses (college and graduate) and research in biological, chemical, geological, mathematical and physical sciences and engineering, including aeronautics, astrophysics, aerodynamics, fluid mechanics, metallurgy and nuclear engineering. NASA international university fellowships are available at this institute.

Carnegie Institute of Technology, College of Engineering and Science, Schenley Park, Pittsburgh 13, Pennsylvania 15213. Offers graduate degree programme in applied space sciences, solid state electronics, systems and communication sciences. Scholarships covering partial tuition are open to undergraduates from abroad, and fellowships and assistantships are open to foreign graduate students having completed one year of study at Carnegie Institute.

Case Institute of Technology, University Circle, 10900 Euclid Avenue, Cleveland 6, Ohio 44106. Offers astronomy, aerospace engineering and plasma dynamics. There is an observatory.

Catholic University of America, Washington 17, D.C. 20017. School of Engineering and Architecture offers a four-year undergraduate course for the bachelor degree in space sciences, and graduate courses for M.Sc. Eng. (space sciences), D. Eng. and Ph. D.

Colorado State College, Greeley, Colorado. Includes Division of Aerospace Studies.

Colorado State University, Fort Collins, Colorado. Engineering College offers aerospace engineering. Tuition scholarships and research assistantships are open to undergraduates and graduates from abroad.

Columbia University, Morningside Heights, New York 27, N.Y. 10027. Offers space science courses in astrophysics (galaxies, interstellar medium, nucleo-synthesis, radio astronomy and stellar structure), celestial mechanics, engineering (communications and radar systems, controls and guidance, flight structures, gas dynamics, materials and plasma physics), planetary physics (general circulation of the atmosphere, magnetosphere and interplanetary plasma, origin of the solar system, planetary bodies and their atmosphere, radiation and convective transfer, the upper atmosphere. NASA international university fellowships are available at this university. Several graduate and undergraduate fellowships of varying amounts for study in various fields are available to applicants from abroad.

Cornell University, Ithaca, New York. Offers astronomy, aerospace engineering, computer science. Arecibo Ionospheric Observatory and Centre for Radiophysics and Space Research conduct radio investigation of the atmosphere, space vehicle instrumentation for study of gases in the solar system, radio investigations of the ionosphere and the gases outside the ionospheric layers, radio investigations of the planets, and radio astronomy of galactic and extra-galactic sources. A 1000-foot diameter radio antenna is available at the Puerto Rico station. Space science courses are offered in aerodynamics, mathematics applied to optimization of orbits and control theory of space vehicles, astrophysics, cosmology, gas dynamics, kinetic theory, magnetohydrodynamics, physics including lunar, planetary, plasma and space physics, radio astronomy and stellar structure. NASA international university fellowships are available at this university. Scholarships (15) usually covering tuition and fees are available to students from abroad ; amount varies depending on level and field of study.

Dartmouth College, Hanover, New Hampshire, including Thayer School of Engineering.

Detroit Institute of Technology, 2300 Park Avenue, Detroit, Michigan 48201, including College of Engineering.

Duke University, Durham, North Carolina 27706, including College of Engineering and Graduate School of Arts and Sciences.

Florida State University, Tallahassee, Florida. Offers meteorology. Fellowships of up to $3,000 and several tuition grants are available to graduate students from abroad.

Georgetown University, 37th and O Street, N.W., Washington, D.C. 20007. Offers courses in astronomy.

Georgia Institute of Technology, Atlanta, Georgia. Includes Engineering College, Engineering Experiment Station, School of Aerospace Engineering.

Scholarships (5) of $600 plus tuition and maintenance are offered to male students from the Institutes of Technology of Stuttgart and Hanover, Federal Republic of Germany, and from the Federal Institute of Technology (ETH), Zurich, Switzerland.

Graduate Research Centre of the Southwest, Dallas, Texas. Research projects only — atmospheric structure, cosmic radiation, geochemistry, geochronology, geomagnetism, ionospheric physics, molecular biology petrology, planetary atmospheres, plasma physics, reaction kinetics, relatively, seismology. NASA International University Fellowships are available.

Harvard University, Cambridge, Massachusetts 02138. Offers astronomy at Harvard College Observatory, meteorology at Blue Hill Meteorological Observatory, astrophysics and aerospace health and safety. Division of Engineering and Applied Physics, Pierce Hall, Cambridge 38, offers courses in fluid dynamics, solid mechanics, magnetohydrodynamics, thermodynamics, control theory and systems analysis. Space science courses are offered in astronomy, biology, chemistry, engineering, geophysics, mathematics and physics. NASA international university fellowships are available at this university. Frank Boas scholarships covering all expenses in the United States of America, plus tuition, are open to nationals of Belgium and Luxembourg for graduate study.

Johns Hopkins University, Baltimore, Maryland 21218. Offers aeronautics, fluid mechanics and meteorology.

Indiana University, Bloomington and Indianapolis, Indiana. Offers astronomy and air science.

Institute for Advanced Study, Princeton, New Jersey. Endowed for post-doctoral research in mathematics and mathematical physics.

Iowa State University of Science and Technology, Ames, Iowa. Includes College of Engineering, aerospace engineering department; there is an Iowa engineering experimental station. Research or teaching assistantships, varying according to qualifications, are granted in co-operation with agencies sponsoring international student exchange in fields including science, engineering and mathematics.

Kansas State University of Agriculture and Applied Science, Manhattan, Kansas 66504. Includes College of Engineering and experiment station.

Lehigh University, Bethlehem, Pennsylvania. Includes Colleges of Engineering and Arts and Sciences and Institute of Research.

Louisiana State University, Baton Rouge, Louisiana. Includes College of Engineering and Engineering Research Station. Graduate assistantships of $1,800 to $3,000, usually awarded in chemistry or physics but available in other fields, are offered to students from abroad.

Massachusetts Institute of Technology (MIT), 77 Massachusetts Avenue, Cambridge 39, Massachusetts 02139. Includes Schools of Engineering and Science, with Departments of Aerospace Studies, Aeronautics and Astronautics, Geology and Geophysics and Meteorology; Centre for Space Research, Research Laboratory of Electronics, Spectroscopy Laboratory, Instrumentation Laboratory and Nuclear Science Laboratory. Space science courses are offered in engineering including space vehicle instrumentation, industrial management, life sciences including nutrition, mathematical sciences, physical sciences and social sciences. NASA International university fellowships are available at this university. A limited number of assistanships are available to graduates from abroad.

Michigan State University, East Lansing, Michigan 48823. Offers physics and astronomy. Tuition scholarships (3) are available to graduates from abroad, and scholarships (3) of $870 are available to Africans.

Michigan Technological University, Houghton, Michigan 49931. Offers chemistry, engineering, geophysics, mathematics and physics. Scholarships of $300 are open to graduates or undergraduates from abroad.

New Mexico State University, University Park, New Mexico. Offers space science courses in applied mathematics, antenna design, sounding rockets, trajectory calculations, astronautics, electromagnetic theory, gas dynamics, radiative heat transfer, optics and physics (atmospheric, plasma and solar energy). NASA international university fellowships are available at this university.

New York University, University Heights, Bronx, New York 3, N.Y. 10453. School of Engineering and Science offers meteorology. Includes Department of Aeronautics and Astronautics, Guggenheim School of Aeronautics. Scholarships and fellowships (20) of $200 to $3,200 are open to graduates and undergraduates from abroad.

Northwestern University, Evanston and Chicago, Illinois. Offers astronomy.

Ohio State University, 190 North Oval Drive, Columbus, Ohio 43210. Offers space science courses in astronomy, aviation medicine, aviation psychology, chemistry, engineering (aeronautical, astronautical, electrical, mechanical, mechanics and metallurgical), geodetic science and physics. NASA international university fellowships are available at this university.

Pennsylvania State University, University Park, Pennsylvania. Includes department of aerospace studies. College of Engineering includes aeronautical engineering department, ionosphere research laboratory and research reactor. College of Mineral Industries includes geophysics and meteorology.

Polytechnic Institute of Brooklyn, 333 Jay Street, Brooklyn 1, New York. Offers aerodynamics, gas dynamics and aerospace engineering. Teaching and research fellowships (45) of approximately $4,300 are available to applicants from abroad, age under 30, in fields including aerospace, chemical, electrical and mechanical engineering, electrophysics, mathematics and physics.

Princeton University, Princeton, New Jersey. Offers astronomy, aeronautical engineering, aerospace sciences and astrophysical sciences, with space science courses in astronomy, astrophysics, biology, chemistry, flight mechanics, gas dynamics, geophysics, jet propulsion and physics (atomic, molecular and plasma). Has an observatory and research centre. NASA international university fellowships are available at this university. Scholarships, fellowships and assistantships (50 to 75) of $1,770 to $3,200, plus full or partial tuition, are open

to men Ph.D. and Master's degree candidates from abroad, in fields including sciences and engineering.

Purdue University, Lafayette, Indiana. Offers aeronautics, astronautics and engineering sciences. Includes Aerospace Sciences Laboratory, Rocket Laboratory, Combustion Laboratory, Environments Laboratory, Control Laboratory and Communications Systems Laboratory. Scholarships (75) of $836 per year covering partial expenses are open to graduates and undergraduates from abroad.

Rice University, P.O. Box 1892, Houston 1, Texas. Offers space science courses in auroras, gamma-ray astronomy, geomagnetism, solar-terrestrial relationships, stellar evolution and astrophysics, the interplanetary medium, Van Allen radiation and cosmic rays. NASA international university fellowships are available at this university. Ora N. Arnold fellowships (1 or 2) are available to nationals of the United States of America who are graduates of Rice University for study at the University of Mexico, and to nationals of Mexico and other Central or South American republics for study in the United States of America. Tenure is one year (renewable), at approximately $1,500.

Saint Louis University, Saint Louis, Missouri 63103. Offers geophysics, air science and aerospace engineering. Includes Parks College of Aeronautical Technology. Scholarships (10 of $333 plus $666 for tuition are open to graduates from abroad in fields including geophysics, chemistry and physics.

Southern Methodist University, University Park, Dallas 22, Texas 75222. Offers a graduate course in aerospace engineering and research in gas dynamics, propulsion and heat transfer.

Stanford University, Stanford, California 94305. Includes Schools of Earth Sciences, Aerospace Studies and Engineering; Department of Aeronautics and Astronautics; Stanford Linear Accelerator Centre; offers space science courses in aeronautical engineering, biology, exobiology, physics, radio astronomy and radio propagation. NASA international university fellowships are available at this university. Graduate fellowships and assistantships of varying amounts are available to graduates from abroad.

Syracuse University, Syracuse 10, New York 13210. Includes Research Institute, College of Engineering; conducts research into potential satellite materials. Fellowships covering tuition and maintenance, and scholarships covering tuition, are open to graduates from abroad, age 20 to 35.

University of Alabama, University, Alabama. Offers space science courses in applied mathematics, biology, chemistry, aerospace engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, nuclear engineering, metallurgy, physics; space research in gas dynamics, electromagnetics, high temperature thermodynamics, plasma technology, re-entry hypersonics and space communications. NASA international university fellowships are available at this university.

University of Alaska, College, Fairbanks, Alaska. Includes College of Mathematics, Physical Science and Engineering and Geophysical Institute.

University of Arizona, Tucson, Arizona. Offers space science courses in astronomy, including lunar and planetary astronomy, chemistry, aerospace engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, nuclear engineering, systems engineering, engineering mechanics, mathematics, metallurgy, meteorology, air science and physics. There is an observatory. NASA international university fellowships are available at this university. Scholarships (60) covering full or partial tuition and fees are open to undergraduates from abroad.

University of California, University Hall, Berkeley, California 94720.

Berkeley Campus, Berkeley, California 94720. Offers space science courses in astronomy, astrophysics, biology, chemistry, engineering (aeronautical, chemical, electrical, mechanical, nuclear and structural), exobiology, geophysics, mathematics, nutrition, physics (atomic, nuclear, plasma, solid state, upper atmosphere), satellite theory, stellar atmospheres and structures. NASA international university fellowships are available at Berkeley campus.

Los Angeles Campus, Los Angeles, California 90024. Offers space science courses in astronomy, astrophysics, biology (environmental, radio and systems), bionics, data processing, engineering (cryogenic systems, heat to electricity conversion and special materials), geochemistry, geophysics, meteorology and physics (cosmic ray and planetary). Has space sciences laboratory. NASA international university fellowships are available at Los Angeles campus.

San Diego Campus, P.O. Box 109, La Jolla, California 92038. Offers earth sciences and aerospace engineering. Research and teaching assistantships and fellowships of varying amounts are open to graduates from abroad.

Lick Observatory, Mount Hamilton, California.

University of Chicago, Chicago 37, Illinois. Offers space science courses in astronomy, astrophysics, chemistry, cosmic rays, geochemistry, geophysics, mathematics, meteorology, nuclear studies and physics. Includes Yerkes Astronomical Observatory, Lake Geneva, Williams Bay, Wisconsin. NASA international university fellowships are available at this university. Scholarships, fellowships and assistantships covering tuition are open to graduate students from abroad.

University of Cincinnati, Cincinnati, Ohio 45221. Offers aerospace engineering, air science and astronomy, with space science courses in celestial mechanics, experimental psychology, heat and mass transfer, high speed gas dynamics, materials science, solid state physics, space medicine and biology, structures and structural dynamics. NASA international university fellowships are available at this university. Fellowships, research fellowships and assistantships (approximately 10) of $1,500 to $3,000, plus tuition in certain cases, are open to students from abroad, with bachelor's degree or equivalent qualification, usually in natural sciences.

University of Colorado, Boulder, Colorado 80304. Offers space science courses in aerodynamics, dynamic meteorology, the ionosphere and physics (low energy atomic, planetary and interplanetary, plasma, solar, stellar atmosphere and upper atmosphere). NASA international university fellowships are available at this university. Scholarships, fellowships and assistantships, varying from $100 to $2,400, are open to graduates and undergraduates from abroad. African students are admitted through the African scholarship programme of American universities.

University of Connecticut, Storrs, Connecticut. Includes School of Engineering, with an Engineering Experimental station; also a Department of Aerospace Engineering.

University of Florida, Gainesville, Florida. Includes College of Engineering and Engineering and Industrial Experiment Station; also Department of Aerospace Engineering. Fellowships and assistantships covering tuition are open to graduates from abroad.

University of Illinois, Urbana, Illinois. Institute of Aviation, College of Engineering, offers aeronautical engineering; Graduate College offers compter science; College of Liberal Arts and Sciences offers astronomy. Fellowships and teaching and research assistantships of varying amounts, usually covering tuition, fees and maintenance, are open to graduates from abroad.

University of Iowa, Iowa City, Iowa. Includes College of Engineering, offering space science courses and research in aurorae and airglow, cosmic rays, experimental work with satellites and deep space probes, geomagnetically trapped radiation, geomagnetism, particles in interplanetary space, physics (magnetosphere, plasma and solar), very low frequency radio waves and planetary magnetism. NASA international university fellowships are available at this university. An exchange scholarship of $1,750 is open to a German student at the University of Tübingen.

University of Kansas, Lawrence, Kansas. Offers aeronautical engineering. Scholarships (25 to 30), exchange scholarships (14) and research and teaching assistantships of approximately $1,300 are open to graduates and undergraduates from abroad.

University of Kentucky, Lexington, Kentucky 40506. Offers astronomy and aerospace science. Tuition scholarships (12), some with additional $200 grant, are open to graduates from abroad.

University of Maryland, College Park, Maryland 20747. Includes College of Engineering, Department of Aerospace Engineering, Institute for Fluid Dynamics and Applied Mathematics, and Wind Tunnel Operations Department. Space science courses in astronomy, astrophysics, cosmic rays, physics (atmospheric, plasma and space) and radioastronomy. NASA international university fellowships are available at this university.

University of Miami, Coral Gables, Florida. Includes School of Environmental and Planetary Sciences.

University of Michigan, Ann Arbor, Michigan. Offers space science courses in astronomy, astrophysics, biological and health sciences, chemistry, cosmic rays, engineering (aeronautical, astronautical, chemical, electrical, instrumentation and control, materials, mechanical, metallurgical and nuclear), geology, magnetohydrodynamics, mathematics, meteorology, oceanography, physics, plasma physics, psychology and radio astronomy. NASA international university fellowships are available at this university.

International Centre, 603 East Madison Street, Ann Arbor, Michigan. Administers six exchange scholarships open to German students at the Free University of Berlin, Hamburg University or any other university in the Federal Republic of Germany, in exchange for similar awards offered to United States students of the University of Michigan. Tenure is one year, the award covering maintenance, tuition, fees and a book allowance of $50, with travel paid in certain cases.

University of Minnesota, Minneapolis, Minnesota 55414. Offers astronomy and geophysics. Space science courses are given in aeronautical engineering, aerospace systems, astrophysics and physics (atmospheric, cosmic ray and plasma). NASA international university fellowships are available at this university.

Tuition scholarships (75) are open to students from abroad who have received admission to the University's Graduate or Undergraduate School. Afro-Asian fellowships (approximately 10) of about $450 are open to graduate students from certain African and Asian countries.

University of Missouri, Columbia, Missouri. Offers aerospace studies. Tuition scholarships (50) are open to undergraduates and graduates from abroad, preferably awarded to students already attending the university. Eight tuition scholarships are open to African students.

University of North Carolina, Chapel Hill, North Carolina. Offers aerospace studies.

University of Notre Dame, Notre Dame, Indiana. Offers air science and aeronautical engineering.

University of Oklahoma, Norman, Oklahoma 73069. Research Institute, 1808 Newton Avenue, Norman. Aerospace and mechanical engineering department includes aerodynamics, structures, thermodynamics, materials, solar energy, cryogenics and weightlessness phenomena. Tuition scholarships are open to graduates and undergraduates from abroad.

University of Pennsylvania, Philadelphia, Pennsylvania, offers astronomy. Thouron awards (30) are available to British students; candidates must be qualified to pursue a course leading to a first or a higher degree, unmarried, and aged under 28. Tenure is variable, at $5,000. Exchange scholarships are available to German students at the Free University of Berlin, covering tuition and maintenance, with one year tenure.

University of Pittsburgh, Pittsburgh 13, Pennsylvania. Division of natural sciences offers earth and planetary sciences. Engineering research division, School of Engineering, offers aeronautical engineering and has an aerospace option in the M.Eng. programme.

University of Rochester, Rochester, New York 14627. Offers space science courses in astronomy, biochemistry, biology, chemistry, engineering (aerospace, biomedical, chemical, electrical and mechanical), geology, optics,

pharmacology, physics, physiology, psychology and radiation biology. NASA international university fellowships are available at this university.

University of Texas, Austin, Texas 78712. Offers astronomy, air science and aerospace engineering. Scholarships and fellowships of varying amounts are open to students from Latin American countries, tenable at any State-supported institution in Texas. Partial tuition scholarships (approximately 50) are open to foreign students having completed one semester at the university.

Texas Christian University : offers astrophysics ; biochemistry ; earth and planetary sciences ; physics — materials and solid state ; psychology — behavioural, learning, and perception ; structural chemistry. NASA International University Fellowships available at this university.

University of Utah, Salt Lake City 1, Utah. Offers geophysics, meteorology and computer science.

University of Virginia, Charlottesville, Virginia. Offers aerospace engineering.

University of Washington, Seattle 5, Washington. Offers astronomy, atmospheric sciences, aeronautical engineering and astronautics. Tuition scholarships (approximately 30) of $575 are open to graduates or undergraduates on an advanced level of study from Canada ; age under 35.

University of Wisconsin, Madison 6, Wisconsin. Engineering Experiment Station, Mechanical Engineering Building, Madison, offers fluid mechanics, structures, heat transfer, plasma studies, satellite instrumentation, communications, rarefied gas dynamics, materials and computers. Also offers space science courses, astronomy, bacteriology, biochemistry, botany, chemistry, engineering (chemical, electrical, mechanical, mechanics, metallurgical and nuclear), genetics, geology, geophysics, mathematics, meteorology, physics, political sciences, psychology and zoology. NASA international university fellowships are available at this university.

University of Wyoming, Laramie, Wyoming. College of Engineering offers space dynamics, vibration and flutter, rocket propulsion, thermodynamics and heat transfer. Scholarships (8) of $238 per semester are open to graduates and undergraduates from abroad.

Vanderbilt University, Nashville, Tennessee 37203. Offers astronomy and physics.

Virginia Polytechnic Institute, Blacksburg, Virginia. Offers aerospace engineering.

Washington University, Saint Louis 30, Missouri. Offers engineering and air science. Fellowships, scholarships and assistantships are available to applicants from abroad.

Wentworth Institute, 550 Huntington Avenue, Boston 15, Massachusetts. Offers courses in aeronautics and electronics ; also research in upper atmosphere.

West Virginia University, Morgantown, West Virginia. College of Engineering, experimental station offers research in aerodynamics, structures and propulsion.

Western Reserve University, 2040 Adelbert Road, Cleveland, Ohio 44106. Offers astronomy.

Yale University, New Haven, Connecticut. Offers space science courses in astronomy, astrophysics, biology, chemistry, engineering and applied science, geology and geophysics, mathematics, microbiology, molecular biophysics, physics and statistics. NASA international university fellowships are available at this university. Scholarships, fellowships and assistantships are open to undergraduates and graduates from abroad.

Department of State, Bureau of Educational and Cultural Affairs, Washington, D.C. 20520, administers United States government grants, unrestricted as to field of study, tenable in the United States of America and available to nationals of most countries. Knowledge of English must be adequate. Foreign students grants (2,100) are for graduate study, usually for one academic year, renewable. Foreign research workers grants (450) are open to candidates with post-doctoral status or equivalent experience ; tenure is three months to one year. Foreign lecturers grants (200) are for post-doctoral candidates to lecture in colleges and universities in the United States, usually for one academic year.

Government grants, available by invitation only, to nationals of most countries, are for foreign specialists (500) to obtain extended professional experience in the United States for an average of four months, and for foreign leaders (1,000) to visit the United States for travel, observation, study and consultation, for approximately two months.

For information on fellowships, scholarships and study grants available to United States nationals and to students at universities in the United States, see the UNESCO publication, *Study Abroad*.[46]

Puerto Rico

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Arecibo Ionospheric Observatory, Arecibo. Possesses 20-degree off-zenith steerable 1,000-ft radar antenna in 18-acre bowl, used for investigation of the planets and of distant radio stars and for study of the properties of the earth's upper atmosphere. Financed by the Advanced Research Projects Agency of the United States, with a director from Cornell University.

Upper Volta

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Station de poursuite de satellites [Satellite Tracking Station], Ouagadougou, Republic of Upper Volta. Operates under CNES.

Uruguay

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Dirección General de Meteorología del Uruguay [National Meteorological Service], Juan Lindolfo Cuestas No. 1525, Casilla de Correo 64, Montevideo.

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[46] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Astronomical Observatory, Casilla de Correo 867, Montevideo.

UNIVERSITIES AND COLLEGES

For information on opportunities for nationals of Uruguay and students at universities in Uruguay, see the UNESCO publication, *Study Abroad*.[47]

Instituto de Estudios Superiores [Institute of Higher Studies], Constituyente 1711, Montevideo. Affiliated societies include Meteorological Society. Scholarships for study, in fields including science, at summer schools (approximately a fortnight in February) are offered to nationals of Latin American countries, covering travel and living expenses. Travel bursaries are offered preferably to teachers from Argentina, Brazil, Chile and Paraguay.

Universidad de la República, avenida 18 de Julio 1824, Montevideo. Includes Faculties of Chemistry, Engineering and Science.

Scholarships for international summer schools are offered specially to graduates and students from the universities of Buenos Aires (Argentina), Santiago (Chile) and de la República (Uruguay). Occasionally they are offered to students from other Latin American countries too. Tenure is one month — February.

Venezuela

NATIONAL AND STATE ACADEMIES

Academia de Ciencias Físicas, Matemáticas y Naturales [Academy of Physical, Mathematical and Natural Sciences], Palacio de las Academias, Apdo. 1421, Caracas. Permanent commissions include mathematics, applied mathematics, astronomy, navigation, physical sciences and meteorology.

GOVERNMENT DEPARTMENTS AND OFFICIAL AGENCIES

Instituto Venezolano de Investigaciones Científicas [Scientific Research Institute], P.O. Box 1827, Caracas. Research fields include physics.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Meteorological Station, Cuidad Bolívar. Formerly a government establishment, now a private station for research in meteorology and climatology.

Juan Manuel Cagigal Naval Observatory, Colina del Calvario, Caracas.

UNIVERSITIES AND COLLEGES

Ministry of Education, esquina El Conde, Caracas. Administers scholarships (2) of the Inter-American Convention for the Promotion of Cultural Exchange, offered to nationals of the United States of America for study in Venezuela. Tenure is one year, at $200 monthly.

For information on fellowships and study grants available to nationals of Venezuela and students at institutions in Venezuela, see the UNESCO publication, *Study Abroad*.[48]

University of the Andes, Merida. Faculty of engineering offers physics and mathematics.

Central University of Venezuela, Caracas. Includes School of Physics and Mathematics.

University of Carabobo, Apdo. Postal 129, Valencia. Offers physics and mathematics.

Andrés Bello Catholic University, Esquina de Jesuitas 37, Apartado 422, Caracas. Offers physics and mathematics.

Zulia National University, Maracaibo. Includes Faculties of Law, Medicine and Engineering. Scholarships for continuation of studies are offered, in certain cases, to students from any country who satisfy the requirements of the university courses.

Oriente University, Cuidad Universitaria, Apartado Postal 105, Cumana, Sucre. School of Sciences includes Departments of Mathematics and Physics.

Yugoslavia

NATIONAL AND STATE ACADEMIES

Yugoslav Academy of Sciences and Arts, Zrinski trg. 11, Zagreb 1. Sections include mathematical sciences and physics, and natural sciences.

Serbian Academy of Sciences and Arts, Knez Mihailova ulica 35, Belgrade. Sections include natural sciences and mathematics, and technical sciences.

LEARNED SOCIETIES, PROFESSIONAL INSTITUTIONS AND OTHER ASSOCIATIONS

Association of Mathematicians and Physicists of Slovenia, P.O. Box 227, Ljubljana.

Association of the Mathematicians' and Physicists' Societies of the Socialist Federal Republic of Yugoslavia, Belgrade.

Astronomical Society "Rudjer Boskovic" and Commission for Astronautics of the Aeronautical Union of Yugoslavia, National Observatory, Kalemegdan, Belgrade.

Croatian Society of Natural Sciences, Ilica 16, Zagreb. The society includes the following: Section of Astronomy (amateur astronomical observatory), Opatička 22, Zagreb. Society for Mathematics and Physics (astronautical section).

Yugoslav Astronautics and Rocket Society, Bulevar Revolucije 44, Belgrade. Belongs to IAF.

Mathematical and Physical Society of Serbia, P.O. Box 791, Belgrade.

[47] UNESCO, *Study Abroad, 1966-1968*, Paris, 1966.

[48] *Ibid.*

Mathematicians' and Physicists' Society of the Socialist Republic of Bosnia and Herzegovina, Sarajevo.

Mathematicians' and Physicists' Society of the Socialist Republic of Macedonia, Skoplje.

GOVERNMENT OR OFFICIAL RESEARCH ESTABLISHMENTS

Astronomical Observatory of Belgrade, Volgina 7, Belgrade.

Geophysical Institute, Faculty of Mathematical Sciences, Zagreb University, Grič3, Zagreb 1.

Hydrometeorological Institute of the Socialist Republic of Croatia, Gric 3, Zagreb 1.

Hydrometeorological Institute of the Socialist Federal Republic of Yugoslavia, Bircaninova 6, P.O. Box 604, Belgrade.

Institute of Aerospace Medicine, Sonje Marinkovic br. 4, Zemun.

Institute of Meteorology, Hadži Loje 4, Sarajevo.

Institute of Comparative Law, Terazije 41, Belgrade. Includes section of aerospace law.

Meteorological Institute of the Faculty of Mathematics, University of Belgrade, Studentski trg. 3, Belgrade.

Meteorological Institute, Faculty of Sciences and Technology, Ljubljana.

Belgrade Meteorological Observatory, Bulevar Jugoslovenske narodne armije 8, Belgrade.

Seismological Institute, Belgrade.

UNIVERSITIES AND COLLEGES

The Commission for Cultural Relations, Moše Pijade 8/1, Belgrade, offers scholarships for study or specialization to nationals of countries which provide reciprocal arrangements to Yugoslavia, and to certain other countries. Tenure is one to five years, depending on the course of studies to be followed, and the award is 35,000 dinars monthly, plus book allowance (60,000 dinars for specialization).

Studentships under the United Nations programme, for university study in Yugoslavia, are offered to students from Trust Territories, Non-Self-Governing Territories, territories administered by Portugal, and South West Africa.

University of Belgrade, Studentski trg. 1, Belgrade. Faculty of Electrical Engineering offers telecommunications, electronics and electromagnetics. Faculty of Sciences offers mathematics, physics, spectroscopy, astronomy and meteorology.

University of Ljubljana, Ljubljana. Faculty of Natural Sciences and Technology offers mathematics, physics and astronomy.

University of Sarajevo, V.S. Obala 7/11, Sarajevo. Faculty of Sciences offers mathematics, physics, climatology and meteorology, electromagnetic field theory, quantum theory and relativity theory.

University of Zagreb, Trg Maršala Tita 14, Zagreb. Faculty of Natural Sciences and Mathematics offers mathematics, physics, geophysics and meteorology.

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BIBLIOGRAPHY

INTERNATIONAL

Study Abroad, 1966-1968: United Nations Educational, Scientific and Cultural Organization, place de Fontenoy, Paris 7e, France.

The World of Learning: Europa Publications Ltd., 18 Bedford Square, London W.C.1, England.

AUSTRIA

Study in Austria (in English, French and German): Austrian Committee for Educational Exchange, Türkenstrasse 4, Vienna IX.

CANADA

Awards for Graduate Study and Research: Canadian Universities Foundation, Ottawa.

DENMARK

Student's Guide to Copenhagen: Danish International Student Committee, 19, Skt. Peders Straede, Copenhagen K.

FEDERAL REPUBLIC OF GERMANY

The Foreign Student in Germany: German Academic Exchange Service, Kennedyallee 50, 532 Bad Godesberg.

FINLAND

Finnish Government Fellowships Available to Foreign Students and Scholars for Studies and Research in Finland: Finnish Commission for International Fellowships, Korkeavuorenkatu 21, Helsinki.

FRANCE

Introduction à une année d'études en France [" Introduction to one year of studies in France "]: Service d'orientation pédagogique des étudiants étrangers de l'Université de Paris, Centre Albert-Chatelet, 8 rue Jean-Calvin, Paris 5e.

Cours organisés par les universités pour étrangers en France [" Courses organized by the universities for foreigners in France "]: Office national des universités et écoles françaises, 96 boulevard Raspail, Paris 6e.

ITALY

Guide for Foreign Students (in English, French, German, Italian and Spanish): Ministry of Public Education, Rome.

JAPAN

Guide to Study in Japan: Japan Publications Trade Company, 1 Kanda Sarugaku-cho 1-chome, Chiyoda-ku, Tokyo.

NETHERLANDS

Facilities for Training in the Netherlands: Netherlands Bureau for International Technical Assistance, Van Alkemadelaan 500, s'Gravenhage.

NEW ZEALAND

Overseas Student's Handbook: New Zealand University Students Association, P.O. Box 6397, Te Aro, Wellington.

PAKISTAN

Handbook of Universities in Pakistan: Inter-University Board of Pakistan, 35 F, Sector G - 6/3, Islamabad.

SWEDEN

Studying in Sweden: Swedish Institute for Cultural Relations with Foreign Countries, Kungsgatan 42, Stockholm C.

Travel, Study and Research in Sweden: Sweden-America Foundation, Grev Turegatan 14, Stockholm 0.

SWITZERLAND

University Education in Switzerland (in English, French, German and Spanish): Swiss Tourist Office, Bahnhofplatz 9, 8001 Zurich.

UNION OF SOVIET SOCIALIST REPUBLICS

Come to study in the USSR (in Arabic, English, French and Spanish): by B. Remennikov and A. Medvedev: obtainable from Soviet Missions abroad.

UNITED KINGDOM

Commonwealth Universities Yearbook: Association of Commonwealth Universities, 36 Gordon Square, London, W.C.1.

United Kingdom Postgraduate Awards: Association of Commonwealth Universities, 36 Gordon Square, London, W.C.1.

Scholarships Abroad: British Council, 65 Davies Street, London, W.1.

UNITED STATES

Handbook on International Study for United States Nationals and *Handbook on International Study for Foreign Nationals:* Institute for International Education, 809 United Nations Plaza, New York, N.Y.

Graduate Study in the United States: Institute of International Education, 809 United Nations Plaza, New York, N.Y.

Fellowships in the Arts and Sciences: American Council on Education, 1785 Massachusetts Avenue, Washington 6, D.C.

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